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Plowing Ahead In Ireland

IMPLEMENT & TRACTOR

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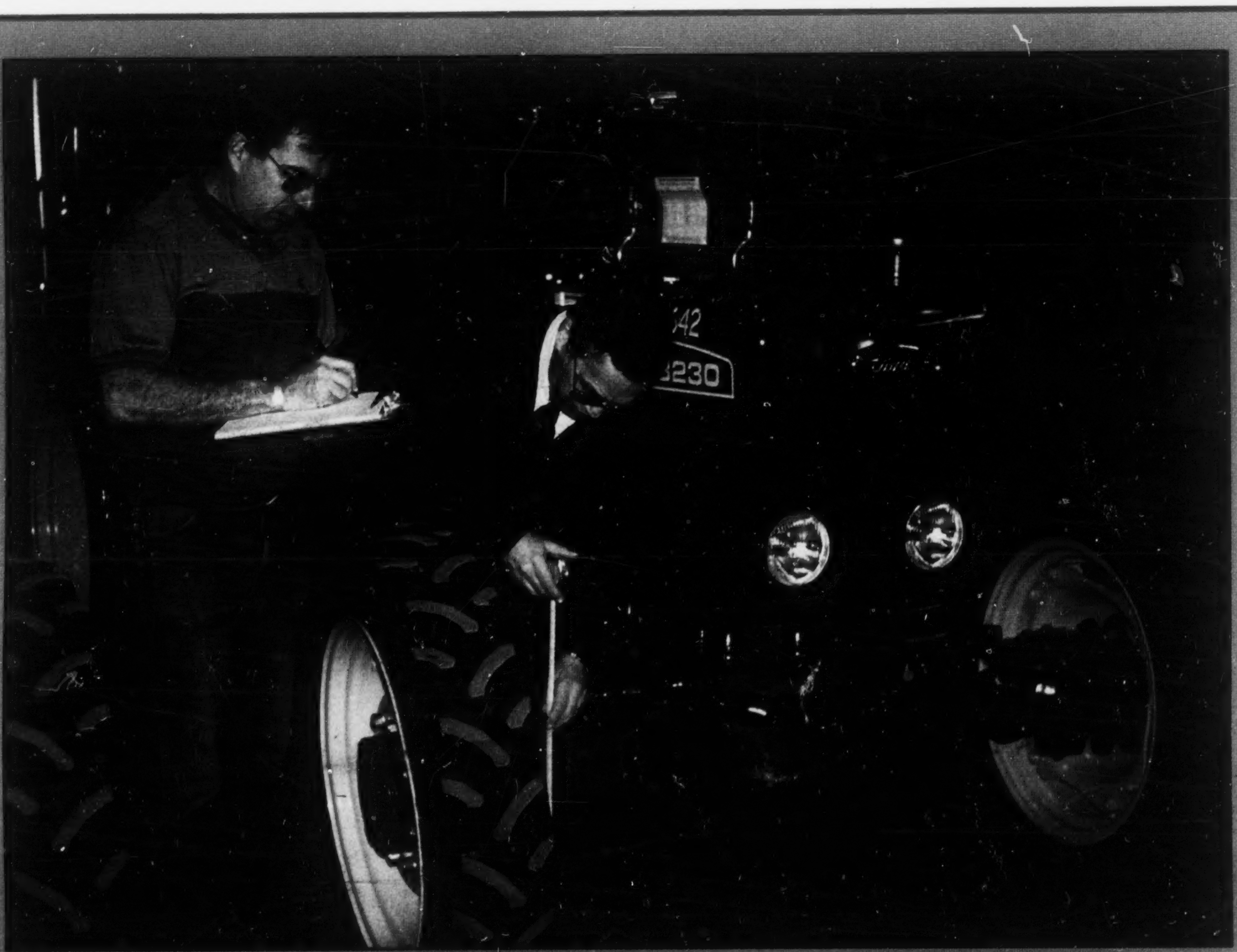

LOUIS LEVITICUS, right, supervisor of the Nebraska Tractor Testing Laboratory and the Center for Engine Technology, records data for testing a British-made Ford tractor with his assistant Dave Morgan.

New Role For Nebraska Lab

By GARY BURCHFIELD

LONG A fixture in the farm machinery business, the University of Nebraska Tractor Testing Laboratory no longer exists.

In its place is a new organization, the Nebraska Power Laboratory. It uses the same facilities on the east campus in Lincoln, but it has a new mission to go with the new name.

The changes came about because some 90 percent of tractor models sold in the United States are now built abroad.

Not many years ago, Nebraska Tractor Test reports were "the only game in town." Practically every tractor model sold in the nation went through the lab, and the results were accepted around the globe.

But with the expanding scope of international trade and the changes

(See LAB, pg. 23)

LITTLE CHANGE

FEMA Forecasts Flat Sales In '92

By CAL PIGG

SHORT LINE farm equipment manufacturers are looking at a no-change sales year in 1992, according to survey results issued during the 41st annual Farm Equipment Manufacturers Association (FEMA) fall convention in Dallas.

Association Executive Vice President Robert Schnell of St. Louis made the prediction during the officer's and editor's breakfast based on a survey of 300 FEMA members.

Sales for calendar year '91 are down 2 percent from 1990 levels and "we don't see anything happening next year to alter the rather unhappy situation," Schnell said. "So, we're forecasting basically a flat year for 1992."

His survey found that manufacturing capacity had dropped to 65 percent in 1991. That compared to 75 percent for 1990 as a whole.

Specifically, in the third quarter '91, all product sales were off 1 percent and orders were down by 15 percent compared to year-ago levels, according to the survey findings. "But there are signs that manufacturers have kept their inventories well in line with customer demand," Schnell said. Dockside product inventories stood at the same level as 12 months earlier and have not risen.

He said manufacturer's receivables had risen to 8 percent from 5 percent of their total sales volumes, for the

(See FLAT, pg. 16)

IMPLEMENT & T
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54th Annual Statistics Issue

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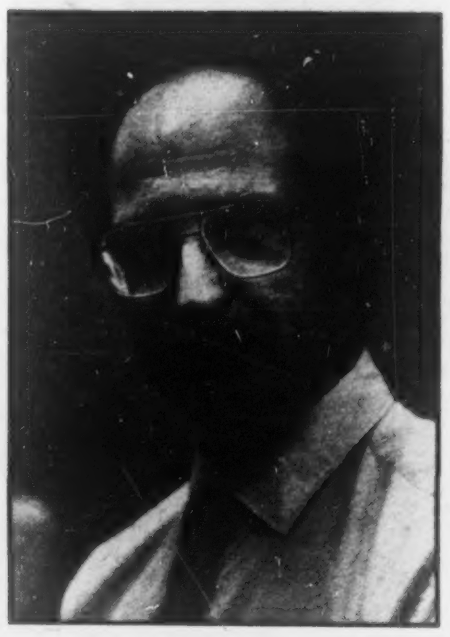
EDITOR'S NOTEBOOK

Who Could Have Imagined The Changes?



By SCOTT NESBITT

IF SOMEONE had laid out the plot line at this time last year, they'd have been sent for serious long-term therapy on the brain.

The year's events in the farm and industrial machinery business read like a "twist on a twist" dream sequence from a TV soap opera, but this time the convoluted changes were for real. Here's a summary of the year's major developments.

Ford New Holland comes under new ownership in the form of N.H. Geotech, a holding company owned 80 percent by Fiat Group of Italy and 20 percent by Ford Motor Co. Geotech controls both the FNH and the Fiatagri farm and construction equipment lines around the world. FoMoCo provides some financing for equipment sales, but Fiat is in charge of operations. Geotech gets to use the blue-and-white Ford oval insignia until 1995, and can use the name Ford in block letters until 2001.

The new operation seeks "synergies" between the Ford and Fiat, but there is no immediate cross-introduction of products or services to dealers. In mid-November, FNH introduces a new tractor line. It turns out to be an actual Ford development, not a Fiat wearing blue paint.

Case-IH gets new leadership. Bob Carlson, former upper-level Deere exec, takes the helm at Case-IH after Jim Ashford quits. Tenneco's undisputed ruler, Jim Ketelsen, who was once the boss as Case, is deposed by the board of directors and replaced by a railroad man. But Michael Walsh, hired away from the Union Pacific, is not a total outsider, having spent time as a Cummins Engine executive.

Large financial losses mar Case IH, the largest single unit within Tenneco. Competitors accuse the company of wild discounting as the sales slump stretched through the year in Europe and North America in both farm and construction equipment. Shortly before the leadership changes, Case undergoes a major internal shuffling that creates four major units. Some say it makes each unit easier to sell.

As a curious side-plot, Irv Aull shows up. He was the boss of International Harvester not long before it's ag business was gobbled up by Case in the dim past of the mid-'80s. Aull becomes the new chief executive for North America for Ransomes, Inc., the big British lawn mower company that owned Bob-Cat and recently took over Cushman, Ryan, Brouwer Turf and Steiner.

Allied Products Corp. lets go of the White tractor line during a period of financial stress, but remains an ag machinery player, keeping the New Idea line, the White planting and tillage line, Bush Hog, Kewanee and other divisions.

Allis-Gleaner Corp. goes on an expansion binge. It takes over the White tractor line, and moves production into the Gleaner combine plant in Independence, Mo.

AGCO absorbs Fiat's half of the Hesston, Kan., plant that makes hay tools for the Hesston brand name and under the label of Case-IH, (the other half-partner in the venture.) U.S. regulators made Fiatagri sell its share before it could buy FNH, to avoid excess concentration in the hay industry. AGCO gets to help build the products and peddle the Hesston name in the United States, but Fiat Group retains use of the Hesston name (but not the U.S.-built product) in Europe.

AGCO forms an alliance with Italy's second-largest tractor builder and introduces an orange-painted tractor line carrying the name AGCO-Allis. The machines are built by SLH (SAME-Lamborghini-Hurlimann) and are virtually identical to SAME models already being sold in North America.

The new AGCO-Allis orange tractors, from 40 to 130 pto hp, have direct air cooling and compete with the green-painted Deutz-Allis tractors (51 to 120 pto hp, air-cooled) that AGCO buys from Klockner-Humboldt-Deutz of Germany, the former owner of the Deutz-Allis operation in North America.

AGCO goes into further competition with itself by handling the silver-painted White tractor line (4 water-cooled models from 125 to 195 pto hp, and 2 of 61 and 81 pto hp), while continuing to handle air-cooled tractors (135 to 193 pto hp) that are built on the White chassis to AGCO specifications and painted orange.

AGCO, after less than 18 months in existence, now handles a huge array of tractors under three different brand names, plus one of the larger hay tool lines. AGCO has sales outlets in 2,000 dealerships, and gets a ready-made base among customers who own some of the predecessor lines of its products: Allis-Chalmers, Deutz, Minneapolis-Moline, Cockshutt, Oliver and Baldwin and a bewildering variety of farm machines, powered and non-powered.

While AGCO seems to be seeking salvation through consolidation, Massey-Ferguson made it quietly through the year, by comparison. Its parent, Varity Corp., stirred up a few political waves north of the border by moving the world headquarters from Toronto, Canada, down to Buffalo, N.Y. And the company makes some sales of the former White axial combine it acquired in the not-too-distant past.

Even John Deere, which seems to roll on placidly toward dominance of the U.S. agricultural machinery market, undergoes some changes. A corporate shuffling melds the consumer and commercial lawn-and-garden lines into a new division, recognizing the increasing importance of the little stuff to the long green line. After settling a new agreement with the United Auto Workers union, Deere & Co. decides to phase out a foundry in East Moline and enters a new international deal that may spell big new things for the next season.

Stay tuned. It may be even more exciting in the coming season! ☐

I&T
54TH ANNUAL MARKET STATISTICS

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Commercial and Consumer Lawn & Garden Equipment Quantity and Dollar Value, 1986-1990

(Value in thousands of dollars)

	1990		1989		1988		1987		1986	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Commercial turf & grounds equip. (Including parts & attachments) (TOTAL)	—	**705,864**	—	**626,517**	—	**595,044**	—	**465,635**	—	**412,836**
Commercial mowing equipment (TOTAL)	—	**566,133**	—	**496,797**	—	**473,509**	—	**390,041**	—	**347,482**
Powered nonriding mowers	48,697	63,044	47,777	54,458	52,359	57,323	44,801	41,207	59,303	44,283
Reel mowers, riding & greens	17,063	133,306	13,266	116,204	11,176	86,887	10,593	71,712	7,004	44,767
Riding rotary turf mowers	30,212	160,125	30,131	157,875	32,466	160,449	31,458	141,644	30,102	123,975
Gang mower sections, reel & rotary	NA	NA	38,993	45,251	37,957	42,460	35,913	39,539	34,327	35,208
Flail mower units, incl. gang	2,818	8,750	3,223	8,426	3,327	9,450	3,302	7,038	3,332	7,550
Other mowing equipment	NA	NA	10,275	10,797	5,290	5,750	6,446	6,684	8,228	7,377
Comm. mower parts & attachments	—	122,745	—	103,786	—	111,190	—	82,217	—	84,322
Other comm. turf & grounds equip.	—	139,731	—	129,720	—	121,535	—	75,594	—	65,354
Tractors, trucks, sod equip. irrig. equip., seeders, spreaders	NA	68,410	296,245	64,970	338,466	56,711	12,169	31,602	13,009	33,046
Aerators, spikers and pluggers	10,087	24,149	9,029	17,903	9,976	20,823	7,628	15,649	6,290	9,931
Dethatchers	2,566	5,130	9,820	6,782	10,257	6,197	4,562	2,651	2,561	1,324
Power brooms, blowers, vacuums, sweepers	10,904	16,989	11,637	16,862	14,257	15,542	10,285	13,554	9,630	12,929
Non-mowing equip. parts and attachments	—	25,053	—	23,203	—	22,202	—	12,138	—	8,124
Consumer lawn & garden equip. (TOTAL)	—	**3,250,248**	—	**3,744,242**	—	**3,936,959**	—	**3,853,665**	—	**3,385,840**
Consumer nonriding l & g, snow equip.	15,189,399	1,598,528	15,671,980	1,746,793	16,018,765	1,771,012	16,129,251	1,777,291	14,100,587	1,581,431
Mowers, reel, push & powered	NA	9,004	28,467	10,675	41,804	17,648	32,537	9,953	73,975	26,305
Mowers, rotary, push	3,861,286	556,792	3,986,630	536,075	3,852,716	524,698	4,115,380	553,670	3,523,116	481,916
Mowers, rotary, self-prop. & all elec.	1,581,322	300,910	1,737,296	412,323	1,961,681	418,579	2,051,026	497,511	1,754,663	374,969
Rotary tillers, 2-wheel tractors	403,366	162,660	389,563	150,651	345,232	138,716	318,758	135,298	324,185	144,310
Snow throwers, single stage	147,646	41,565	170,314	45,610	199,829	52,568	359,343	104,288	336,603	75,227
Snow throwers, dual stage	76,963	43,702	107,632	64,226	186,763	107,630	212,852	101,279	201,826	107,829
Edgers, trimmers, power, fixed blade	101,749	18,501	436,640	34,713	507,764	44,474	528,561	46,011	468,642	43,411
Edgers, trimmers, power, elec. & other	NA	50,273	4,454,917	245,100	4,426,293	221,235	4,411,536	162,625	4,422,903	170,427
Shredders, shredder-grinders	108,556	40,487	76,776	29,374	72,330	26,425	59,545	19,567	67,211	26,048
Yard vacuums & blowers	1,672,609	106,792	1,575,019	97,655	1,393,710	91,147	939,451	56,863	877,004	50,012
Lawn sweepers (non-attached type)	NA	NA	36,114	5,170	44,821	6,022	52,403	5,935	74,468	8,960
Other nonriding l & g, snow equip.	2,196,780	103,772	2,672,612	115,221	2,985,822	121,870	3,048,129	84,291	1,975,991	72,017
Consumer riding l & g, snow equip.	1,372,760	1,651,720	1,183,387	1,392,504	1,235,608	1,511,984	1,257,788	1,505,611	1,058,636	1,255,382
Lawn tractors, riders, front engine	977,956	998,429	817,568	853,542	734,227	765,387	738,679	809,273	621,919	677,300
Lawn tractors, riders, rear engine*	264,179	280,013	271,622	275,421	364,047	344,703	399,730	381,223	307,662	266,528
Garden tractors and other riding equip.*	107,412	372,918	94,197	263,541	137,334	401,894	119,379	315,115	129,055	311,824
Nonriding parts & attachments	—	293,833	—	229,533	—	222,851	—	150,907	—	161,779
Riding equip. parts & attachments	—	404,894	—	375,412	—	431,112	—	419,856	—	387,248

SOURCE: U.S. Dept. of Commerce Census Bureau Industrial Report MA35A(90)-1, "Farm Machinery and Garden Equipment," issued November 26,1991, and previous years' MA35A reports. In some categories, I&T has combined data to save space.

*Does not include all units because of non-disclosure of some sub-categories.

Imports of Farm Equipment by Product, 1988-1991

Product	Jan.-Dec. 1988		Jan.-Dec. 1989		Jan.-Dec. 1990		Jan.-June 1991	
	Quantity	Value in Thousands of Dollars	Quantity	Value in Thousands of Dollars	Quantity	Value in Thousands of Dollars	Quantity	Value in Thousands of Dollars
Knives & Cutting Blades	8,293,169	$ 10,156	9,269,758	$ 12,943	9,806,140	$ 24,715	4,682,162	$ 6,366
Plows & Listers	2,482	8,429	8,484	18,059	25,829	31,442	25,237	9,789
Cultivators & Weeders	56,922	32,044	31,449	51,788	49,998	62,306	14,973	21,137
Parts of Plows	—	41,256	—	29,713	—	24,945	—	8,957
Harrows, Rollers, Stalk Cutters, Soil Pulverizers	33,147	27,020	39,455	29,543	42,251	69,082	19,752	18,983
Parts of Harrows, Scarifiers, Cultivators, Weeders & Shoes	—	31,567	—	64,311	—	58,702	—	31,975
Planting, Seeding & Fertilizing Machinery	44,900	28,168	75,907	42,547	100,008	57,371	34,234	19,022
Parts of Planting, Seeding & Fertilizing Machinery	—	11,130	—	16,390	—	16,827	—	8,863
Haying Machinery other than Mowers	8,271	10,561	10,604	10,671	13,074	13,927	7,527	10,231
Mowers except Lawn Mowers	36,236	46,867	33,020	49,795	39,313	77,332	22,641	40,377
Harvesting Machines, NEC	8,624	55,789	8,245	56,337	5,484	70,517	5,406	32,515
Parts of Harvesting Machines	—	82,905	—	89,079	—	94,778	—	38,479
Farm Wagons & Carts	4,839	6,828	15,195	6,138	4,394	4,361	4,269	1,457
Agricultural Machines & Implements, NEC	—	184,730	—	192,247	—	101,973	—	48,401
Parts of Agricultural Machines	—	151,677	—	123,479	—	83,977	—	33,304
Tractors, Agricultural, Wheel-Type New, excluding Industrial*	101,922	1,056,533	96,466	1,122,068	103,477	1,211,914	85,030	553,915
Parts for Agri. Tractors	—	384,454	—	255,603	—	338,047	—	145,052
Walk-Behind Rotary Tillers	16,431	6,068	39,126	6,381	14,639	4,619	4,179	12,918

Source: U.S. Department of Commerce, International Trade Administration, Office of Capital Goods and International Construction. *Use of the term "industrial" here is understood to refer to such machines as forklifts but not to industrial tractors as commonly defined.
NEC — Not Elsewhere Counted.

Value of Shipments, 1985-1990
Farm Tractors, Farm Machinery And Garden Equipment Including Parts, Attachments

(In Thousands of Dollars)

Type of product	1990	1989	1988	1987	1986	1985
Wheel tractors farm type	**NA***	**NA***	**NA***	**958,597**	**893,432**	**1,154,527**
Planting, seeding and fertilizing machinery	573,081	632,247	508,566	409,082	371,210	453,250
Harrows, rollers, pulverizers, stalk cutters	192,413	206,283	136,923	99,918	99,238	166,014
Plows	117,140	136,770	117,725	74,643	75,310	110,984
Harvesting machinery	2,002,034	1,860,432	1,422,751	1,282,315	1,230,124	1,190,831
Haying machinery	727,744	732,250	574,587	433,671	383,434	498,116
Farm dairy machines and equipment	88,232	110,050	95,492	76,584	77,131	92,308
Sprayers and dusters	270,287	302,022	274,994	214,484	212,566	244,412
Farm elevators and blowers	60,510	59,358	64,342	73,648	82,049	66,877
Cultivators and weeders	178,890	202,037	154,471	104,619	81,103	139,985
Machines for preparing crops for market or use	214,968	208,641	193,275	208,189	203,657	193,727
Farm poultry equipment	178,224	157,762	144,149	116,763	93,420	109,000
Hog equipment	73,904	64,718	75,717	66,415	41,964	35,938
Other barn and barnyard equipment	169,502	215,582	214,133	164,142	129,146	156,768
Stalk shredders and cutters or rotary mowers	152,121	192,460	197,576	161,462	112,073	120,581
Farm wagons, other farm transportation equipment	2,324,046	2,207,172	1,725,202	149,217	109,291	105,480
Irrigation systems	304,195	377,790	298,307	215,689	160,417	186,654
Total farm machinery	**NA**	**NA**	**NA**	**5,324,025**	**4,355,565**	**5,402,166**
Total agricultural equipment	**9,531,487**	**8,297,091**	**6,793,254**	**6,282,621**	**5,248,997**	**6,556,693**
Commercial turf, mowing equipment	566,133	496,797	473,509	416,240	347,482	316,566
Other turf, grounds care equipment	139,731	129,720	121,535	98,346	65,354	59,148
Total commercial grounds equipment	**705,864**	**626,517**	**595,044**	**514,586**	**412,836**	**376,704**
Consumer nonriding lawn, garden, snow equipment	1,598,528	1,976,326	1,993,863	1,911,663	1,743,210	1,688,642
Consumer riding lawn, garden, snow equipment	1,651,720	1,767,916	1,943,096	2,068,286	1,642,630	1,466,472
Total lawn & garden equipment	**3,250,248**	**3,744,242**	**3,936,959**	**3,979,949**	**3,385,840**	**3,155,114**
Total farm tractors, farm machinery, commercial and consumer equipment	**13,487,599**	**12,036,333**	**10,730,213**	**9,303,973**	**9,047,653**	**10,088,611**

*Tractors included with "Farm Wagons, other farm transportation equipment" for 1988 and 1989.
SOURCE: U.S. Department of Commerce Census Bureau Current Industrial Report MA35A-(89)-1, "Farm Machinery and Garden Equipment," issued October 1990, and previous years' MA35A reports.

Principal Machines on Farms — 1991

STATE	WHEEL TRACTORS			SELF-PROPELLED COMBINES			CORN HEADS		POWER ELEVATORS	MANURE SPREADERS	CORN & COTTON PLANTERS	GRAIN DRILLS	MOLDBOARD PLOWS	SI DELI RAI
	1982 Census Number	1987 Census Number	Estimated July 1, 1990 Number	1982 Census Number	1987 Census Number	Estimated July 1, 1990 Number	1982 Census Number	Estimate July 1, 1990 Number	Estimated July 1, 1990 Number	Estimated July 1, 1990 Number	Estimated July 1, 1990 Number	Estimated July 1, 1990 Number	Estimated July 1, 1990 Number	Estim July 1, Num
Maine	13,569	14,260	14,750	320	540	540	181	160	4,790	2,795	275	755	7,540	5,1
New Hampshire	5,097	5,052	5,175	8	23	20	50	40	2,260	1,785	250	50	2,575	2,1
Vermont	15,274	15,295	15,415	76	128	125	374	355	7,290	5,635	1,415	280	8,715	6,5
Massachusetts	9,956	13,160	13,520	23	60	60	145	140	3,270	2,035	775	90	5,215	3,1
Rhode Island	1,364	1,556	1,610	6	8	5	13	10	450	235	85	25	605	2
Connecticut	8,421	9,218	9,825	53	84	80	98	75	3,805	2,190	910	70	4,950	2,2
New York	119,498	115,509	115,630	6,030	7,887	7,910	3,904	3,950	63,420	36,010	17,435	23,925	69,010	42,4
New Jersey	20,554	23,375	23,680	1,011	1,096	1,100	593	580	5,580	2,155	2,130	2,190	14,380	3,5
Pennsylvania	136,505	142,342	142,530	9,707	13,744	13,780	5,408	5,600	67,560	37,255	30,045	35,910	87,660	43,8
Delaware	8,012	7,128	7,490	1,342	1,280	1,300	1,006	955	3,585	1,580	1,880	1,810	5,530	9
Maryland	36,951	37,672	38,210	3,279	3,579	3,625	2,840	2,770	14,900	7,505	7,665	7,915	24,795	7,9
NORTHEAST	**375,201**	**384,567**	**387,835**	**21,855**	**28,429**	**28,545**	**14,612**	**14,635**	**176,910**	**99,180**	**62,865**	**73,020**	**230,975**	**118,2**
Ohio	193,367	197,852	197,320	33,200	35,908	36,150	26,403	26,200	116,145	50,385	56,875	57,200	140,905	49,8
Indiana	167,563	171,059	171,700	34,646	36,151	36,450	31,391	29,100	115,280	44,555	58,320	46,595	120,330	36,7
Illinois	262,112	263,319	262,845	61,411	60,208	61,010	55,636	53,000	175,520	65,170	85,315	58,760	156,095	47,7
Iowa	305,334	302,392	301,755	57,726	60,004	60,510	57,046	56,400	185,370	88,945	94,875	54,505	185,985	80,7
Missouri	193,758	196,774	195,955	32,957	33,765	34,015	21,834	20,200	82,180	49,995	45,445	47,370	131,100	47,6
CORN BELT	**1,122,134**	**1,131,396**	**1,129,575**	**219,940**	**226,036**	**228,135**	**192,310**	**184,900**	**674,495**	**299,050**	**340,830**	**264,430**	**734,415**	**262,7**
Michigan	146,655	143,734	144,455	21,060	23,587	23,660	13,583	14,300	82,375	32,875	34,490	46,015	113,605	39,1
Wisconsin	243,827	250,979	250,105	19,215	25,315	25,390	11,939	13,250	129,950	75,480	60,815	58,660	145,525	81,7
Minnesota	264,581	265,669	265,775	45,847	51,183	51,490	31,098	31,600	145,550	68,285	73,205	68,015	156,960	79,0
LAKE STATES	**655,063**	**660,382**	**660,335**	**86,122**	**100,085**	**100,540**	**56,620**	**59,150**	**357,875**	**176,640**	**168,510**	**172,690**	**416,090**	**199,9**
North Dakota	108,103	111,746	111,705	27,546	30,502	30,700	2,708	3,030	70,535	18,580	13,640	53,835	57,570	20,6
South Dakota	105,699	106,997	106,910	16,961	19,025	19,175	9,606	10,300	62,635	25,960	27,605	30,485	57,765	20,9
Nebraska	164,308	171,501	171,195	34,032	35,024	35,125	25,484	25,240	97,070	39,780	41,215	39,075	81,985	31,8
Kansas	149,870	150,647	151,320	46,662	43,801	44,120	8,321	7,250	103,560	33,165	19,985	63,480	83,235	32,7
GREAT PLAINS	**527,980**	**540,891**	**541,130**	**125,201**	**128,352**	**129,120**	**46,119**	**45,820**	**333,800**	**117,485**	**102,445**	**186,875**	**280,555**	**106,2**
West Virginia	27,110	27,690	27,840	562	874	875	471	480	6,245	7,515	4,750	3,325	17,155	8,7
Kentucky	163,176	167,810	169,565	11,466	12,572	12,630	9,924	10,250	24,110	24,795	34,975	10,275	97,465	28,3
Tennessee	126,365	126,678	127,055	11,227	10,260	10,290	6,508	6,680	14,865	18,090	47,265	12,830	63,245	22,5
Virginia	88,511	84,991	84,760	6,224	6,993	7,030	5,061	5,130	18,360	19,355	23,535	15,475	58,725	21,5
North Carolina	131,488	121,125	121,530	13,820	13,617	13,660	10,618	10,200	20,120	18,945	66,385	20,745	56,420	14,7
APPALACHIAN	**536,650**	**528,294**	**530,750**	**42,299**	**44,316**	**44,485**	**32,582**	**32,740**	**83,700**	**88,700**	**176,910**	**62,650**	**293,010**	**95,8**
South Carolina	44,338	40,783	41,610	6,263	5,077	5,125	3,808	3,600	4,660	3,495	27,815	10,705	9,805	5,4
Georgia	75,505	73,732	73,635	8,980	8,831	8,890	6,438	5,735	13,650	5,930	35,355	9,235	27,875	9,7
Florida	52,346	158,854	62,670	1,742	1,638	1,645	1,307	1,330	3,615	1,065	5,420	1,600	18,070	1,7
Alabama	66,330	66,163	67,580	6,935	5,870	5,880	3,630	3,600	11,200	3,955	38,525	6,490	20,855	7,01
SOUTHEAST	**238,519**	**339,532**	**245,495**	**23,920**	**21,416**	**21,540**	**15,183**	**14,265**	**33,125**	**14,445**	**107,115**	**28,030**	**76,605**	**23,9**
Mississippi	70,139	62,506	63,280	9,695	7,371	7,400	861	950	7,660	4,515	47,845	7,640	26,340	9,00
Louisiana	56,883	53,568	54,405	8,468	6,567	6,625	286	240	2,500	2,600	15,140	6,835	19,705	5,81
Arkansas	81,556	83,111	82,985	12,891	10,831	10,820	221	190	9,355	6,350	19,885	12,200	43,545	9,70
DELTA STATES	**208,578**	**199,185**	**200,670**	**31,054**	**24,769**	**24,845**	**1,368**	**1,380**	**19,515**	**13,465**	**82,870**	**26,675**	**89,590**	**24,51**
Oklahoma	99,934	106,518	106,295	17,299	15,781	15,810	600	500	24,975	8,250	8,405	29,810	72,855	18,4
Texas	264,740	288,018	287,105	21,049	21,260	21,350	3,913	3,875	39,750	15,655	50,535	46,695	83,330	21,42
S. PLAINS	**364,674**	**394,536**	**393,400**	**38,348**	**37,041**	**37,160**	**4,513**	**4,375**	**64,725**	**23,905**	**58,940**	**76,505**	**156,185**	**39,87**
Montana	54,666	56,648	56,470	12,038	12,025	12,060	89	70	27,780	9,720	1,000	20,165	25,885	12,96
Idaho	50,575	54,534	54,965	9,309	9,495	9,550	344	320	24,250	12,120	2,430	14,660	31,430	15,18
Wyoming	20,673	20,360	20,580	1,991	2,127	2,130	221	230	4,985	4,160	870	3,905	14,755	4,89
Colorado	56,141	59,043	59,440	7,994	8,469	8,510	2,618	2,590	24,975	12,370	5,685	14,565	24,710	13,35
New Mexico	17,455	19,162	19,260	1,346	1,541	1,535	308	320	2,545	2,015	2,890	1,840	8,260	3,94
Arizona	12,262	13,364	14,070	369	382	390	94	90	1,780	855	1,735	1,345	3,170	1,32
Utah	21,613	23,985	24,595	1,591	1,754	1,755	225	220	9,970	6,705	1,550	5,195	14,275	8,77
Nevada	5,160	5,768	5,780	234	294	285	19	20	930	985	60	300	2,400	1,40
Mt. STATES	**238,545**	**252,864**	**255,160**	**34,872**	**36,087**	**36,215**	**3,918**	**3,860**	**97,215**	**48,930**	**16,220**	**61,975**	**124,885**	**61,815**
Washington	59,377	63,139	63,580	8,314	7,996	8,020	558	580	21,530	12,760	1,675	16,300	34,900	12,78
Oregon	53,243	55,813	56,050	6,235	6,442	6,470	209	220	17,370	11,285	1,040	11,220	33,920	11,24
California	139,735	153,271	158,175	6,102	6,087	6,130	1,123	1,130	24,005	13,275	8,420	8,435	56,705	12,965
PACIFIC	**252,355**	**272,223**	**277,805**	**20,651**	**20,525**	**20,620**	**1,890**	**1,930**	**62,905**	**37,320**	**11,135**	**35,955**	**125,525**	**36,98**
TOTAL	**4,519,699**	**4,703,870**	**4,622,155**	**644,262**	**667,056**	**671,205**	**369,115**	**363,055**	**1,904,265**	**919,120**	**1,127,840**	**988,805**	**2,527,835**	**970,26**

*Not reported separately. [1]Cutter bar type only. [2]Shear-bar type. [3]Does not include windowers with conditioning rolls. [4]Includes engines used for stationary work and number of power units not elsewhere classified.
Source: U.S. Department of Commerce Census Bureau Census of Agriculture, 1987 and 1982. Estimates based on interpretation of data from that census, Census Bureau Current Industrial Reports, and various industry and private data sources. This table corrects some mathematical errors that appeared in the data in last year's I&T statistical issue.

U.S. Farm Wheel Tractor Retail Sales, 1986-1990

2-Wheel Drive	1986	1987	1988	1989	1990
Under 40 hp	61,648	59,902	54,741	46,926	42,040
40 & Under 100 hp	30,848	30,718	33,160	34,910	38,411
100 & Under 140 hp	5,149	5,089	4,320	5,214	22,797
140 hp & Over	9,113	10,822	11,802	15,369	
Total 2-Wheel Drive	**106,758**	**106,531**	**104,023**	**102,419**	**103,248**
4-Wheel Drive					
Under 200 hp	595	602	998	1,125	
200 hp & Over	1,442	1,051	1,731	3,026	
Total 4-Wheel Drive	**2,037**	**1,653**	**2,729**	**4,151**	**5,102**
TOTAL Farm Wheel Tractors	**108,795**	**108,184**	**106,752**	**106,570**	**108,350**

SOURCE: Equipment Manufacturers Institute (formerly Farm & Industrial Equipment Institute).

POWER TRACTOR MOWERS[1]	PICK-UP BALERS			-FIELD FORAGE HARVESTERS[1]		MOWER CONDITIONERS[2]			MOTOR TRUCKS			INTERNAL COMBUSTION ENGINES[4]	CHAIN SAWS	
Estimated July 1, 1990 Number	1982 Census Number	1987 Census Number	Estimated July 1, 1990 Number	1982 Census Number	Estimated July 1, 1990 Number	1982 Census Number	1987 Census Number	Estimated July 1, 199 Number	1982 Census Thousands	1987 Census Thousands	Estimated July 1, 1990 Thousands	Estimated July 1, 1990 Number	Estimated July 1, 1990 Number	
5,810	3,047	2,925	2,920	1,181	1,220	2,353	2,326	2,330	12.2	12.2	12.1	1,220	7,115	Maine
2,655	1,259	1,207	1,210	544	560	960	963	975	4.1	3.9	3.8	1,140	2,350	New Hampshire
7,895	4,167	3,882	3,890	2,569	2,735	3,866	3,706	3,730	7.5	7.3	7.2	1,585	5,915	Vermont
3,485	1,704	1,993	2,005	1,083	1,105	1,533	1,783	1,795	9.4	11.0	11.1	1,640	4,310	Massachusetts
280	205	196	195	93	95	146	245	245	1.3	1.3	1.3	165	595	Rhode Island
3,055	1,508	1,595	1,600	773	805	1,318	1,506	1,530	6.8	6.9	6.8	1,435	3,615	Connecticut
48,575	28,078	26,136	26,190	19,040	19,560	25,603	25,229	25,610	60.5	56.7	56.8	19,190	47,795	New York
4,015	2,260	2,467	2,480	1,165	1,180	2,386	2,641	2,655	15.2	16.1	16.2	2,115	5,685	New Jersey
53,855	37,257	37,180	37,280	18,078	18.430	29,456	32,352	32,675	66.1	67.1	67.2	18,255	41,880	Pennsylvania
930	531	492	500	249	255	519	474	475	6.2	6.0	6.0	850	2,410	Delaware
9,970	5,719	6,126	6,150	2,670	2,730	5,136	5,638	5,720	25.9	24.3	24.4	4,130	11,665	Maryland
140,525	**85,735**	**84,199**	**84,420**	**47,445**	**48,675**	**73,276**	**76,863**	**77,740**	**215.2**	**212.8**	**212.9**	**51,725**	**133,335**	**NORTHEAST**
56,940	39,754	38,910	38,820	11,090	11,270	26,143	29,717	29,950	107.8	103.9	103.8	17,500	58,035	Ohio
44,520	23,947	25,191	25,270	6,917	6,990	15,583	18,613	18,830	112.2	111.2	111.3	18,080	62,070	Indiana
62,695	30,463	30,000	29,940	9,972	10,080	21,867	23,144	23,350	150.6	144.3	144.5	26,905	67,500	Illinois
94,610	47,776	46,867	46,950	17,638	18,100	28,401	31,333	31,710	147.7	143.4	143.5	28,645	53,650	Iowa
76,440	48,662	48,649	48,740	8,055	8,110	26,527	28,982	29,410	159.7	160.1	160.2	29,580	89,880	Missouri
335,205	**190,602**	**189,617**	**189,720**	**53,672**	**54,550**	**118,521**	**131,789**	**133,250**	**678.0**	**662.9**	**663.3**	**120,710**	**331,135**	**CORN BELT**
42,260	25,051	24,924	24,910	11,809	12,050	21,055	21,051	21,140	80.3	77.2	77.2	16,275	43,425	Michigan
91,405	58,042	56,739	56,870	43,880	44,810	51,630	52,292	52,860	99.5	97.2	97.1	31,185	88,135	Wisconsin
85,080	51,038	49,402	49,500	23,803	24,225	32,050	34,770	35,050	143.8	138.8	139.0	42,325	63,020	Minnesota
218,745	**134,131**	**131,065**	**131,280**	**79,492**	**81,085**	**104,735**	**108,113**	**109,050**	**323.6**	**313.2**	**313.3**	**89,785**	**194,580**	**LAKE STATES**
35,955	16,628	17,690	17,700	4,839	4,925	6,181	7,611	7,690	101.1	106.3	106.4	31,895	4,070	North Dakota
41,990	17,966	18,928	18,960	10,568	10,775	6,958	7,980	8,060	68.0	73.9	74.0	21,155	3,135	South Dakota
48,570	18,906	19,603	19,630	12,538	12,690	15,497	16,767	16,910	118.9	127.2	127.3	28,930	13,400	Nebraska
47,125	31,998	31,892	31,850	9,367	9,435	18,932	20,167	20,310	159.4	159.3	159.4	37,290	22,105	Kansas
173,640	**85,498**	**88,113**	**88,140**	**37,312**	**37,825**	**47,568**	**52,525**	**52,970**	**447.4**	**466.7**	**467.1**	**119,270**	**42,710**	**GREAT PLAINS**
16,565	10,550	11,233	11,260	2,323	2,350	6,033	6,548	6,590	20.5	19.7	19.6	4,530	20,695	West Virginia
44,620	35,143	38,418	38,520	7,910	8,080	23,805	28,233	28,580	125.2	122.4	122.5	14,565	42,455	Kentucky
47,820	26,506	29,438	29,520	6,313	6,380	18,734	22,007	22,250	104.7	101.1	101.2	11,225	56,285	Tennessee
29,180	21,805	23,152	23,220	6,209	6,425	14,659	16,094	16,240	68.0	63.8	63.7	10,860	46,055	Virginia
29,655	12,752	13,954	14,010	3,502	3,560	10,888	11,965	12,080	103.3	94.2	94.1	14,135	82,930	North Carolina
167,840	**106,756**	**116,195**	**116,530**	**26,257**	**26,795**	**74,119**	**84,847**	**85,740**	**421.7**	**401.2**	**401.1**	**55,315**	**248,420**	**APPALACHIAN**
9,125	4,823	5,301	5,340	1,260	1,285	4,033	4,500	4,540	34.6	31.8	31.9	5,565	23,425	South Carolina
15,205	10,407	11,175	11,215	2,717	2,740	9,465	11,111	11,160	72.6	68.6	68.7	11,475	32,310	Georgia
3,475	3,754	3,742	3,745	861	875	7,591	7,736	7,760	51.2	51.6	51.7	10,955	7,400	Florida
14,875	11,322	13,346	13,380	2,112	2,125	8,212	10,780	10,800	67.4	65.8	65.7	9,330	30,510	Alabama
42,680	**30,306**	**33,564**	**33,680**	**6,950**	**7,025**	**29,301**	**34,127**	**34,260**	**225.8**	**217.8**	**218.0**	**37,325**	**93,645**	**SOUTHEAST**
19,680	10,509	10,222	10,215	1,927	1,940	7,949	8,029	8,040	59.0	50.6	50.7	8,985	36,020	Mississippi
9,930	6,425	6,725	6,740	1,327	1,340	6,698	6,723	6,740	44.3	39.7	39.6	10,695	19,760	Louisiana
19,015	13,994	15,596	15,650	1,634	1,635	10,035	11,436	11,495	79.3	79.4	79.4	12,120	30,355	Arkansas
48,625	**30,928**	**32,543**	**32,605**	**4,888**	**4,915**	**24,682**	**26,188**	**26,275**	**182.6**	**169.7**	**169.7**	**31,800**	**86,135**	**DELTA STATES**
29,750	22,690	24,820	25,000	2,491	2,500	17,107	18,194	18,320	122.8	126.3	126.3	18,160	9,785	Oklahoma
43,210	33,736	41,208	41,360	5,109	5,175	39,629	47,054	47,390	249.9	267.8	267.9	54,205	19,125	Texas
72,960	**56,426**	**66,028**	**66,360**	**7,600**	**7,675**	**56,736**	**65,248**	**65,710**	**372.7**	**394.1**	**394.2**	**72,365**	**28,910**	**S. PLAINS**
19,640	12,468	13,482	13,530	2,429	2,450	8,102	9,429	9,460	68.2	72.6	72.7	16,535	11,655	Montana
19,580	12,210	12,101	12,025	2,384	2,410	8,515	9,093	9,115	57.1	59.1	59.1	13,535	13,010	Idaho
5,630	5,066	5,181	5,195	1,222	1,230	3,904	4,207	4,220	22.1	23.1	23.2	5,355	3,155	Wyoming
14,440	10,365	11,240	11,320	3,503	3,525	7,040	8,668	8,700	63.0	68.1	68.1	17,395	6,075	Colorado
4,320	3,403	3,280	3,300	802	815	2,395	2,711	2,720	24.6	27.2	27.2	6,505	2,965	New Mexico
1,860	1,042	1,138	1,145	348	360	861	1,032	1,035	16.6	16.6	16.5	4,450	505	Arizona
9,925	6,965	7,076	7,130	1,978	2,045	5,547	6,031	6,050	23.3	25.7	25.8	5,645	2,330	Utah
1,430	1,598	1,791	1,800	437	450	1,314	1,384	1,390	6.5	7.3	7.2	1,320	590	Nevada
76,825	**53,117**	**55,289**	**55,445**	**13,103**	**13,285**	**37,678**	**42,555**	**42,690**	**281.4**	**299.7**	**299.8**	**70,740**	**40,285**	**MT. STATES**
19,015	9,518	9,782	9,850	3,060	3,120	9,838	9,930	9,960	69.2	69.7	69.8	14,135	22,430	Washington
17,890	9,730	9,565	9,560	2,555	2,595	8,528	9,215	9,240	61.2	61.3	61.4	18,330	25,465	Oregon
21,655	6,725	6,697	6,715	2,715	2,810	9,299	10,570	10,580	147.9	157.6	157.6	54,920	31,515	California
58,560	**25,973**	**26,044**	**26,125**	**8,330**	**8,525**	**27,665**	**29,715**	**29,780**	**278.3**	**288.6**	**288.8**	**87,385**	**79,410**	**PACIFIC**
1,335,605	**799,472**	**822,657**	**824,305**	**285,049**	**290,355**	**594,281**	**651,970**	**657,465**	**3,426.7**	**3,426.7**	**3,428.2**	**736,420**	**1,278,565**	**TOTAL**

Canadian Farm Wheel Tractor Retail Sales, 1986-1990

2-Wheel Drive	**1986**	**1987**	**1988**	**1989**	**1990**
Under 40 hp	4,307	4,680	4,207	3,940	3,574
40-99 hp	9,382	9,021	9,344	7,881	7,228
100 hp & Over	3,451	3,065	2,333	2,953	2,602
Total 2-Wheel Drive	**17,140**	**16,766**	**15,884**	**14,774**	**13,404**
Total 4-Wheel Drive	**1,609**	**984**	**1,337**	**1,454**	**1,585**
TOTAL Farm Wheel Tractors	**18,749**	**17,750**	**17,221**	**16,228**	**14,989**

SOURCE: Canadian Farm & Industrial Equipment Institute.

Shipments Of Farm Machines And Equipment In Units (1985-1990)

Type of farm equipment	1990	1989	1988	1987	1986	1985
Balers, hay (all types):	36,422	33,409	25,974	18,002	10,556	7,542
Blowers (includes forage type, combination grain-forage type)	NA	3,104	3,773	2,907	2,375	2,636
Cabs, farm tractor	NA	NA	NA	3,499	2,027	2,932
Cabs, other equipment	NA	NA	NA			
Combines, grain, pull-type and self-propelled	NA	11,525	7,573	9,484	8,288	7,027
Combine corn and grain heads*	24,573	20,402	14,302	4,485	4,291	2,829
Cultivators, corn and cotton types	15,173	13,113	10,154	6,906	4,110	8,168
Cultivators, field:						
Pull-type, folding	5,800	6,403	4,207	2,940	1,504	3,897
Mounted and non-folding pull type	5,680	NA	NA	1,258	1,313	1,646
Cultivators, rotary	4,335	3,708	2,062	1,072	1,058	3,282
Cultivators and weeders, other	3,147	9,148	5,296	10,901	11,891	12,818
Cutters and shredders or rotary mowers (pto):						
Flail-type	4,591	3,772	4,879	2,913	1,434	4,523
Horizontal blade-type	106,617	231,683	229,498	140,462	100,254	98,459
Diggers (shakers, windrowers) combines for peanut	5,431	2,888	1,422	1,031	1,148	1,296
Distributors (fertilizer):						
Dry	5,796	19,525	15,862	5,206	4,545	6,143
Liquid	3,859	3,490	3,317	2,031	2,470	4,715
Anhydrous ammonia		NA	973	933	1,247	1,563
Dryers, grain, hay and seed batch type, pto or electric-motor operated	NA	2,153	1,362	2,455	3,900	3,983
Continuous flow-type	1,045	801	556	544	765	695
Heated air units	3,488	2,447	2,005	3,588	6,378	9,818
Dusters, power, all types	86,717	NA	944	1,277	901	971
Elevators, portable:						
Single chain	2,195	1,490	1,726	1,627	1,467	2,839
Double chain	1,220	2,047	6,707	6,139	8,482	5,887
Auger-type, under 6-in. dia.	7,231	7,499	7,947	9,269	8,188	7,939
Auger-type, 6-in. dia.	13,949	3,329	6,345	7,434	8,641	6,578
Auger-type, over 6-in. dia		11,863	11,221	9,776	8,953	7,167
Elevators, stationary and other	8,054	7,029	7,045	44,404	60,069	37,749
Fans, crop drying and aeration	11,108	8,664	8,430	22,151	37,123	12,850
Grain drills, fixed-frame, all types	13,001	11,405	6,439	5,113	4,492	7,159
Grain heads for combines	*	*	*	9,212	9,835	9,978
Grinder-mixers, stationary and portable	2,881	3,718	4,211	3,406	1,717	1,467
Harrows, disk	11,287	13,234	17,892	11,498	12,048	17,908
Harrow sections (spike-, spring-, tine-tooth and power)	27,373	25,536	23,508	17,052	15,274	21,068
Harrows, rollers, pulverizers	7,306	7,564	7,330	7,583	6,325	9,388
Harvesters, beet and potato	466	317	289	260	195	345
Harvesters, forage, shear-bar type, self-propelled and pull	4,631	3,958	3,508	2,186	1,997	2,647
Harvesting machinery, other (including cotton)	3,872	4,080	4,242	2,915	2,986	4,073
Levelers or scrapers 3512C-55,57,59	NA	2,601	1,829	2,065	1,992	2,034
Loaders, field, for baled hay	NA	963	1,337	1,513	1,143	1,488
Loaders, tractor mounted, farm	18,445	16,425	27,494	14,078	20,960	17,900
Mills, feed, farm size (includes grinders and crushers of the hammer, burr or roller types)	2,430	2,301	2,322	2,537	2,073	2,416
Mixers, feed, farm size	3,856	2,343	2,646	1,983	1,360	1,671
Mowers, cutter bar-type	9,815	5,047	3,143	2,302	2,665	3,934
Mower-conditioners, self-propelled and pull-type	19,498	15,988	13,821	10,733	10,556	12,397
Planters, row crop, all types (quantity in number of rows)	29,503	38,926	19,734	34,352	20,311	37,417
Plows, chisel or sweep type:						
Pull-type	NA	2,762	2,771	1,924	1,875	2,389
						4,910
Mounted	1,812	2,192	1,825	1,777	930	1,477
Plows, disk-chisel combination	3,573	2,774	2,507	1,904	1,911	2,976
Plows, subsoiler	2,680	2,947	2,102	1,202	1,000	2,208
Plows, terracing and ditching	391	383	1,663	294	417	753
Plows, moldboard, all types	NA	859	760	1,327	1,902	1,902
Plows, middle busters and disk bedders	2,331	2,181	1,849	1,495	1,853	2,469
Rakes, hay, side-delivery	12,251	10,925	7,127	4,173	5,339	8,072
Sprayers, field and row crop type:						
Power, self-propelled	2,781	2,560	1,808	1,151	1,057	1,898
Power, tractor-mounted	11,508	10,640	9,513	8,417	8,604	14,146
Power, non-tractor-mounted	3,649	3,856	3,597	4,195	4,438	5,127
Sprayers, power, not field or row crop type	6,041	7,212	6,458	6,167	6,122	4,674
Sprayers, power, air-carried	729	2,762	2,310	1,647	1,993	2,603
Spreaders, manure:						
Conveyor type	9,579	10,664	11,543	9,379	8,279	6,586
Tank type	3,286	2,869	2,840	2,415	2,440	2,371
Terracers, blade, or scrapers	31,447	32,874	32,862	54,879	43,679	48,071
Tillage equipment, combination roller/harrows, disk or coulter, field cultivators, disk or coulter/spring tooth 3523C-53	7,325	6,190	4,053	2,868	3,530	5,094
Tool bars, basic units, pull, mounted 3523C-96	1,634	1,413	1,572	1,402	1,511	1,729
Tractors, wheel, farm-type, 2-wheel drive, including front-wheel assist.						
Under 100 pto horsepower	NA	NA	NA	9,323	13,017	12,653
100 pto horsepower and over	NA	NA	NA	9,393	9,316	16,072
4-wheel drive	NA	NA	NA	3,656	1,893	2,624
Wagons, farm type, chassis only, and trailer gear	32,853	31,931	28,728	23,511	18,411	17,442
Wagon boxes and racks for mounting on wagons and trailer gear						
Manual unloading or dump	12,539	14,985	15,219	15,365	13,013	14,032
Gravity unloading, grain type	9,058	11,153	10,870	8,383	7,545	5,712
Power unloading	9,966	14,311	11,977	9,667	8,694	7,912
Wagon boxes with integral running gear	3,102	2,293	2,739	2,646	1,818	2,205

*Figures for combine corn and grain heads listed together for 1988, 1989 and 1990, separately in prior years.

SOURCE: U.S. Department of Commerce Census Bureau Current Industrial Report MA35A(90)-1, "Farm Machinery and Garden Equipment," released Nov. 26, 1991, and previous years' MA35A reports. In some categories, I&T has combined data to save space.

Value of U.S. Farm Equipment Exports of Destination,

(Value In Thousands

Country	1987	1988
Western Hemisphere		
Canada	$646,049	$584,645
Mexico	67,894	121,734
Guatemala	4,603	5,214
Honduras	4,761	6,193
El Salvador	2,366	2,230
Costa Rica	3,954	5,171
Panama	7,811	3,449
Dominican Republic	14,502	19,819
Colombia	17,973	17,050
Jamaica	5,797	3,109
Venezuela	57,265	62,649
Brazil	22,619	24,968
Argentina	15,417	8,089
Bolivia	2,115	657
Chile	8,462	12,332
Ecuador	6,051	7,035
Peru	5,812	9,357
Paraguay	2,874	1,072
Europe		
Denmark	5,797	8,918
Sweden	9,882	26,197
United Kingdom	63,063	98,173
Netherlands	12,052	18,096
Belgium-Luxemburg	49,830	82,298
France	95,630	128,925
Germany	55,058	75,788
Hungary	8,763	4,626
Switzerland	2,149	3,795
Spain	22,150	25,172
Italy	13,218	20,352
Greece	2,169	19,936
Soviet Union	1,175	8,602
Yugoslavia	1,616	5,417
Middle East		
Israel	7,232	7,341
Saudi Arabia	115,555	129,930
Turkey	4,905	5,210
Jordan	2,938	2,574
Asia and Pacific		
Thailand	1,590	4,212
Singapore	8,057	10,967
China (Taiwan)	3,304	5,627
China (P.R.C.)	9,634	10,096
Philippines	2,525	4,838
Korea	5,929	15,053
Japan	25,949	35,305
Australia	49,110	121,834
New Zealand	2,108	3,022
Africa		
Algeria	4,680	5,855
Morocco	4,156	3,696
Sudan	5,902	5,623
Nigeria	4,483	3,408
Egypt	4,680	3,316
Rep. South Africa	24,034	40,583
Total U.S. Exports, Farm & Industrial Equipment*	**$1,579,894**	**$1,911,409**

***Includes all countries, not just those listed.**

Source: U.S. Department of Commerce, International Trade and International Construction.

Industrial
y Countries
987-1991

Dollars)

1989	Jan.-Dec. 1990	Jan.-June 1991
24,437	$817,141	$348,125
42,873	201,265	88,499
8,853	8,700	3,801
7,138	5,692	3,296
3,371	2,350	883
6,775	9,107	2,269
4,048	6,397	3,893
16,698	16,309	8,662
15,879	16,414	9,962
10,147	10,009	3,104
22,786	16,282	15,026
21,076	25,513	25,123
6,689	9,189	4,216
1,219	1,891	679
16,975	17,578	12,071
17,186	11,779	7,603
4,187	5,451	2,921
644	1,282	244
9,459	7,020	8,466
24,494	21,491	10,359
06,960	118,537	47,921
18,531	28,545	23,490
84,919	98,227	29,585
61,346	141,232	82,249
78,791	102,215	90,333
27,089	10,325	7,854
5,287	5,753	4,718
40,192	35,907	24,376
22,865	26,381	19,891
16,345	8,557	3,825
2,700	7,307	1,706
1,631	12,220	2,564
6,952	9,318	4,235
97,384	110,891	39,349
2,810	1,912	838
1,526	918	65
4,265	7,857	11,180
51,697	52,726	27,331
12,161	15,521	7,717
13,430	12,804	6,804
5,098	2,735	2,810
18,414	24,838	20,500
36,141	100,240	58,607
08,739	185,918	50,934
7,154	8,119	3,337
3,242	1,769	474
1,421	1,764	202
3.161	4,720	490
4,265	2,228	828
6,564	7,900	1,846
38,768	33,690	15,828
02,808	**$2,508,476**	**$1,204,830**

istration, Office of Capital Goods

New Agricultural Tractor Imports, 1990, 1991 (First Half)

(In Units)

	Country of Origin	Under 40 HP	40-79 HP	80-99 HP	100 HP & Over	Other*	Totals
1990	Belgium	—	1,297	88	2,8114	116	4,315
	Brazil	—	82	21	7	28	138
	Canada	8	146	15	526	—	695
	China	226	13	—	—	—	239
	Czechoslovakia	173	1,067	51	71	1	1,363
	France	8	135	52	435	26	656
	Germany	115	10,517	6,358	1,068	573	18,631
	Italy	144	511	309	353	150	1,467
	Japan	37,134	2,454	220	90	819	40,717
	Korea	250	—	—	—	—	—
	Mexico	—	561	83	2	3	649
	Netherlands	—	—	—	—	15	15
	Romania	—	1,200	—	—	—	1,200
	Soviet Union	1,776	917	2,227	5	1	4,926
	United Kingdom	3,676	17,749	3,661	212	656	25,954
	Yugoslavia	—	425	—	—	—	425
	Totals	**44,613**	**37,622**	**13,085**	**5,584**	**2,573**	**103,477**
1991 (First Half)	Belgium	—	124	33	848	32	1,037
	Brazil	—	300	—	—	2	302
	Canada	6	40	—	554	—	600
	China	107	7	—	—	—	114
	Czechoslovakia	1	484	9	4	—	498
	France	—	5	2	57	—	64
	Germany	11	3,775	2,502	1,136	27	7,451
	Italy	—	498	140	169	136	943
	Japan	17,507	791	111	44	1,977	20,430
	Korea	—	—	—	—	—	—
	Mexico	—	—	—	—	2	2
	Netherlands	—	—	—	—	—	—
	Romania	—	655	—	—	—	655
	Soviet Union	961	53	1,076	—	6	2,096
	United Kingdom	1,610	7,234	966	83	165	10,058
	Yugoslavia	—	327	—	—	—	327
	Totals	**20,369**	**14,532**	**4,839**	**2,895**	**2,395**	**45,030**

Source: U.S. Department of Commerce, International Trade Administration, Office of Capital Goods and International Construction. *For 1989, 1990 and 1991, "Other" includes units whose horsepower is not specifically provided, tractors without power take off and garden tractors, but not rotary tillers. Totals include countries not individually listed.

Dollar Value of Farm Equipment Imports by Country of Origin, Jan., 1986-June, 1991

(In Thousands)

Country	Jan.-Dec. 1986	Jan.-Dec. 1987	Jan.-Dec. 1988	Jan.-Dec. 1989	Jan.-Dec. 1990	Jan.-June 1991
Canada	$366,074	$497,337	$575,949	$554,118	$507,598	$192,915
Mexico	6,218	11,419	37,008	32,041	25,553	7,933
Brazil	10,967	18,877	27,632	29,732	25,150	19,843
Sweden	4,538	4,731	4,805	4,554	7,069	4,297
Denmark	7,290	9,676	13,106	9,055	16,742	7,069
Netherlands	29,778	31,513	33,422	28,841	38,091	19,270
United Kingdom	234,406	256,182	366,337	378,660	425,322	188,874
Belgium	42,537	46,125	64,028	67,283	135,039	41,497
France	64,556	64,776	118,789	118,590	141,479	61,853
Germany	252,740	244,560	289,718	326,937	506,875	226,957
Austria	3,455	4,480	6,279	3,566	11,544	2,248
Yugoslavia	1,251	7,766	8,968	5,343	4,747	2,431
Hungary	1,816	5,917	5,620	13,136	13,288	6,673
Czechoslovakia	6,197	3,759	6,849	7,085	10,259	2,965
Romania	1,921	5,326	5,710	5,208	4,467	2,665
Italy	118,808	128,651	154,915	158,473	158,072	74,340
Spain	5,978	6,254	7,436	9,198	5,728	2,745
Israel	7,475	8,629	9,171	9,274	8,262	3,565
New Zealand	8,123	11,012	12,903	6,375	5,588	2,008
Australia	5,941	7,159	8,429	9,548	4,637	1,985
Japan	418,780	420,852	388,774	370,349	343,272	185,465
China (Taiwan)	6,066	7,297	8,322	9,501	7,673	3,315
China (P.R.C.)	3,002	5,408	6,345	4,302	5,249	2,799
Korea	5,667	7,456	19,842	29,136	29,741	12,403
Soviet Union	3,731	5,394	9,599	12,127	20,591	10,471
TOTAL*	**$1,630,628**	**$1,834,925**	**$2,206,957**	**$2,229,902**	**$2,501,812**	**1,102,336**

Source: U.S. Department of Commerce, International Trade Administration, Office of Capital Goods and International Construction.
*Total includes all countries, not just those listed.

Exports of Farm Equipment by Product, 1988-1991

	Jan.-Dec. 1988		Jan.-Dec. 1989		Jan.-Dec. 1990		Jan.-June 1991	
Product	Quantity	Dollar Value in Thousands	Quantity	Dollar Value in Thousands	Quantity	Dollar Value in Thousands	Quantity	Dollar Value in Thousands
Combines, pull-type.	644	$9,766	1,228	$17,501	998	$27,656	358	$10,024
Combines, self-propelled	2,333	96,119	5,261	160,057	3,583	181,501	1,537	81,514
Cultivators, tractor-drawn or mounted	1,748	4,332	2,585	5,109	1,095	2,100	1,597	2,118
Cultivators, NEC, and Weeders	6,031	6,902	4,728	7,416	12,196	41,666	4,081	6,228
Farm Elevators and Blowers	1,866	5,326	NA	NA	NA	NA	NA	NA
Farm Wagons and Carts	1,863	4,490	2,488	5,688	—	—	—	—
Parts for Farm Wagons and Carts	—	709	—	2,815	—	—	—	—
Fertilizing Machines	5,055	10,906	8,532	13,942	8,281	17,671	5,406	11,125
Forage Harvesters	1,878	30,355	1,677	32,209	1,598	29,860	793	19,806
Harrows, Disk	1,316	4,649	1,960	6,403	1,692	6,447	718	2,710
Harrows, NEC, & Scarifiers	8,786	8,145	5,616	5,079	4,281	4,629	2,162	3,286
Parts for Harrows, Stalk Cutters & Soil Pulverizers	—	3,293	—	5,817	—	52,000	—	35,012
Harvesting Machines, NEC	3,915	63,930	2,399	42,473	3,212	44,910	2,528	32,872
Harvesting Machine Parts	—	53,509	—	44,206	—	—	—	—
Hay Balers	9,033	54,993	9,765	60,693	8,355	72,065	3,589	35,551
Haying Machines, NEC (incl. rakes & tedders)	3,460	18,954	4,830	29,538	3,947	30,770	1,913	15,773
Parts for Haying Machine	—	23,278	—	20,510	—	18,299	—	6,509
Mowers, Cutterbar, tractor-mounted	1,659	4,930	7,102	12,649	14,722	30,784	12,229	20,657
Mowers, Rotary, tractor-drawn excl. lawn mowers)	14,057	8,504	39,172	20,075	13,938	8,963	16,133	7,930
Mowers, NEC, tractor-drawn (excl. lawn mowers)	3,335	7,773	2,231	6,930	555	1,794	76	330
Planting Machines	1,818	7,152	3,260	11,027	3,281	12,898	1,898	6,510
Plows, Disk	597	1,511	517	1,843	477	1,204	352	1,038
Plows, Moldboard	1,122	4,320	394	1,903	347	1,611	88	401
Plows & Listers, NEC	4,369	9,083	5,403	15,190	2,705	7,669	965	3,477
Parts for Plows, Listers, Cultivators & Weeders	—	9,922	—	9,328	—	3,447	—	1,309
Seeding Machines	3,984	11,469	6,340	17,193	6,974	22,975	1,820	8,219
Parts for Planting, Seeding & Fertilizing Machines	—	17,761	—	15,853	—	15,373	—	7,139
Sprayers, Agricultural, including parts	—	227,752	—	294,425**	—	387,668	—	196,120
Farm Tractors:								
Under 40 PTO HP	730	3,582	6,805*	30,165*	13,231	51,274	5,748	24,598
40-59 PTO HP	211	2,378	117	1,850	278	3,824	185	2,458
60-79 PTO HP	212	2,551	125	1,983	313	5,607	80	1,748
80-99 PTO HP	158	3,238	93	2,445	208	6,521	85	2,653
100-119 PTO HP	1,016	32,855	1,050	34,753	808	26,389	311	11,726
120-139 PTO HP	1,597	56,292	2,039	67,530	1,529	60,111	697	27,829
140-159 PTO HP	1,353	52,073	2,184	80,612	1,540	66,959	905	39,894
160-179 PTO HP	804	33,914	1,303	54,961	1,009	49,807	563	27,125
180 PTO HP & Over	1,016	56,686	2,051	107,834	2,127	127,753	946	54,264
Other Farm Tractors	2,306	31,617	2,815	25,731	2,943	52,148	1,518	19,409
Parts for Farm Tractors	—	680,695	—	621,271	—	508,331	—	226,335

SOURCE: U.S. Department of Commerce, International Trade Administration, Office of Capital Goods and International Construction. *1989, 1990 and 1991 data appear to include garden tractors.
**Includes irrigation equipment.
NEC - Not Elsewhere Counted.

INDUSTRY NEWS

Here, for your evaluation, is a wrapup of some of the hotter news items to hit the ag/industrial/power equipment business as the year neared an end.

***

Deere & Co. announced signing in early November with Fiat S.p.A. of Italy and Hitachi Construction Machinery Co., Ltd., of Japan a memorandum of understanding for a potential joint agreement in the field of construction equipment.

The memorandum sets in motion an "exploratory and evaluation process" to explore possible cooperation for the manufacture and distribution of a broad range of construction machinery, primarily in Europe, Africa and the Middle East—those geographic lines exactly duplicate the organizational line of Deere's overseas, which generates about 20 percent of the corporation's total business.

The talks were to focus on the operations of Fiat-Hitachi and the Fiat-Allis operations in Lecce, Italy, which builds a backhoe-loader using Deere designs.

Deere spokesman Robert J. Combs noted other ties among the 3 firms. Deere's Dubuque, Iowa, plant has been building, since 1987, a line of 4-wheel-drive loaders, backhoes and utility crawlers sold under the Hitachi name outside the U.S.

***

Downsizing and consolidation seems to be the rule throughout the ag and industrial machinery business, continuing the pattern that began in the early 1980s.

Some 4,700 employees worldwide were furloughed this year in the Fiat and Ford New Holland operations that are now controlled by N.H. Geotech. In the FNH heartland in Lancaster County, Pa., 432 people were cut, dropping the work force to about 2,400 people.

At Deere, there's a plan to drop about 2,100 positions from salaried and wage ranks over the next 2 to 3 years. The company said its fourth quarter results for the period that ended October 31 would include a special after-tax charge of about $120 million to cover the reduction costs. Deere, in agreeing this fall to a new contract with the United Auto Workers union, wrote in provisions to shutter its East Moline, Ill., foundry over the next 2 years, affecting 604 people there.

For the third business quarter that ended July 31, Deere & Co. reported net income of $31.3 million (41 cents a share) compared to income of $114.1 million for the same period of 1990. Worldwide sales and revenues were down 13 percent of $1.79 billion, compared to $2.053 billion a year earlier. Worldwide production was down 19 percent for the third quarter 1991.

JI Case has eliminated about 5,000 jobs worldwide since September 1990, and issued a report setting aside $413 million future restructuring that will include unspecified amounts personnel reduction, plant closings and "product rationalization."

That $413 million charge was written into the books for 1991's third quarter, when Case sustained an operating loss of $169 million compared to income of $26 million for the third quarter of 1990. Case's parent, Tenneco, showed a overall third quarter loss of $693 million on sales and revenues of $3.182 billion, but

(See NEWS, pg. 23)

INDUSTRY UPDATE

Lower Losses In Some Sales Sectors

SALES WERE less than dismal for some big-ticket farm machines, with combines and 2-wheel-drive tractors over 100 pto hp doing acceptably well in portions of the 3 months running from August through October, according to the flash reports of the Equipment Manufacturers Institute.

Combines were a relatively bright spot. This year's sales topped the results from August 1990 by 10.7 percent. September sales were dismally behind the 1990 figures, but October saw some improvement, with the result that sales for the first 10 months were only 3.9 percent behind 1990 results.

The bigger 2wd tractors were only 5 percent behind 1990 by the end of October, perhaps proving that buyers exist as long as prices are low enough to lure them out.

Canadian sales figures reported by the Canadian Farm and Industrial Equipment Institute followed about the same trend, with larger 2wd tractors actually ahead of 1990 sales by the end of September, and combines 13.9 percent ahead of last year.

The EMI inventory figures would presage no shortage of machinery for next year, with existing supplies approximating 8 months to 1 year of sales at the current pace in all categories. ☐

U.S. - UNIT RETAIL SALES

	August			January-August			July 1991 Inventory
Equipment	1991	1990	% Change	1991	1990	% Change	N.A. Factory & U.S. Field
Farm Wheel Tractors:							
2-Wheel Drive							
Under 40 HP	2,547	3,101	(17.9)	27,062	31,747	(14.8)	33,725
40 & Under 100 HP	2,336	2,729	(14.4)	24,344	27,281	(10.8)	23,712
100 HP & Over	757	841	(10.0)	13,534	13,558	(22.3)	12,198
Total 2-Wheel Drive	**5,640**	**6,671**	**(15.5)**	**64,940**	**72,586**	**(10.5)**	**69,635**
Total 4-Wheel Drive	**238**	**282**	**(15.6)**	**2,616**	**3,334**	**(21.5)**	**2,535**
Total Farm Wheel Tractors	**5,878**	**6,953**	**(15.5)**	**67,556**	**75,920**	**(11.0)**	**72,170**
Combines:							
(Self-Propelled)	561	507	10.7	5,868	5,600	4.8	5,288

U.S. - UNIT RETAIL SALES

	September			January-September			August 1991 Inventory
Equipment	1991	1990	% Change	1991	1990	% Change	N.A. Factory & U.S. Field
Farm Wheel Tractors:							
2-Wheel Drive							
Under 40 HP	2,625	3,010	(12.8)	29,565	34,757	(14.9)	29,358
40 & Under 100 HP	2,484	2,534	(2.0)	26,910	29,815	(9.7)	22,761
100 HP & Over	983	1,167	(15.8)	14,520	14,725	(1.4)	11,961
Total 2-Wheel Drive	**6,092**	**6,711**	**(9.2)**	**70,995**	**79,297**	**(10.5)**	**64,080**
Total 4-Wheel Drive	**244**	**195**	**25.1**	**2,867**	**3,529**	**(18.8)**	**2,244**
Total Farm Wheel Tractors	**6,336**	**6,906**	**(8.3)**	**73,862**	**82,826**	**(10.8)**	**66,324**
Combines:							
(Self-Propelled)	679	1,161	(41.5)	6,554	6,761	(3.1)	4,535

U.S. - UNIT RETAIL SALES

	October			January-October			September 1991 Inventory
Equipment	1991	1990	% Change	1991	1990	% Change	N.A. Factory & U.S. Field
Farm Wheel Tractors:							
2-Wheel Drive							
Under 40 HP	2,573	2,858	(10.0)	32,258	37,615	(14.2)	33,225
40 & Under 100 HP	2,964	3,302	(10.2)	29,760	33,117	(10.1)	22,625
100 HP & Over	1,893	2,549	(25.7)	16,411	17,274	(5.0)	14,468
Total 2-Wheel Drive	**7,430**	**8,709**	**(14.7)**	**78,429**	**88,006**	**(10.9)**	**70,318**
Total 4-Wheel Drive	**617**	**618**	**(.2)**	**3,483**	**4,147**	**(16.0)**	**2,307**
Total Farm Wheel Tractors	**8,047**	**9,327**	**(13.7)**	**81,912**	**92,153**	**(11.1)**	**72,625**
Combines:							
(Self-Propelled)	1,269	1,380	(8.0)	7,823	8,141	(3.9)	5,436

These data are, in part, estimates which are subject to revisions when final detail data become available. Because of the seasonal nature of the industry comparisons of monthly data from one period to another should be done with extreme caution. These data represent most, but not all, of the manufacturers in each product category being sold at retail in the fifty states and the District of Columbia.

Canada Report
Retail Sales In Units

		August			August/Ytd	
EQUIPMENT	**1991**	**1990**	**% Chg.**	**1991**	**1990**	**% Chg.**
FARM WHEEL TRACTORS						
2WD under 40 H.P.	188	281	-33.1%	1,905	2,650	-29.1%
2WD 40-99 H.P.	370	515	-28.2%	3,817	4,626	-17.5%
2WD 100 H.P. & Over	114	97	17.5%	1,677	1,684	-4.0%
Total 2WD	**672**	**893**	**-24.7%**	**7,399**	**8,960**	**-17.4%**
Total 4WD	**83**	**89**	**-6.7%**	**1,015**	**1,158**	**-12.3%**
TOTAL FARM WHEEL TRACTORS:	**755**	**982**	**-23.1%**	**8,414**	**10,118**	**-16.8%**
COMBINES						
Self Propelled	244	267	-8.6%	867	718	20.8%
Pull Type	44	32	37.5%	83	90	-7.8%
BALERS						
Rectangular Balers	84	167	-49.7%	576	933	-38.2%
Round Balers	398	582	-31.6%	341	388	-12.1%
SWATHERS						
Self Propelled	231	191	20.9%	514	500	2.8%
Pull Type	324	404	-19.8%	542	819	-33.8%
FORAGE HARVESTERS						
Shear Bar Type	54	79	-31.6%	341	388	-12.1%
MOWER CONDITIONERS	**336**	**489**	**-31.3%**	**2,431**	**2,715**	**-10.5%**

Canada Report
Retail Sales In Units

		September			September/Ytd	
EQUIPMENT	**1991**	**1990**	**% Chg.**	**1991**	**1990**	**% Chg.**
FARM WHEEL TRACTORS						
2WD under 40 H.P.	202	183	10.4%	2,109	2,833	-25.6%
2WD 40-99 H.P.	409	418	-2.2%	4,224	5,044	-16.3%
2WD 100 H.P. & Over	153	102	50.0%	1,830	1,786	2.5%
Total 2WD	**764**	**703**	**8.7%**	**8,163**	**9,663**	**-15.5%**
Total 4WD	**53**	**74**	**-28.4%**	**1,068**	**1,232**	**-13.3%**
TOTAL FARM WHEEL TRACTORS:	**817**	**777**	**5.1%**	**9,231**	**10,895**	**-15.3%**
COMBINES						
Self Propelled	236	250	-5.6%	1,103	968	13.9%
Pull Type	23	51	-54.9%	91	141	-35.5%
BALERS						
Rectangular Balers	65	84	-22.6%	643	1,017	-36.8%
Round Balers	291	301	-3.3%	2,822	3,240	-12.9%
SWATHERS						
Self Propelled	102	138	-26.1%	592	633	-6.5%
Pull Type	123	247	-50.2%	628	1,066	-41.1%
FORAGE HARVESTERS						
Shear Bar Type	40	56	-28.6%	381	444	-14.2%
MOWER CONDITIONERS	**164**	**271**	**-39.5%**	**2,595**	**2,986**	**-13.1%**

BALERS

(From pg. 19)

the highest density available, with the easiest system for controlling density, and that we make the nicest-looking bales in the business. Farmers want their work to look good, and that was a big consideration in this new design."

The company said the current model 853 and 855 balers will be replaced for the 1992 season by the 650 and 660 models, which produce bale widths of 46.5 and 61.5 inches respectively, with diameters of 45 to 70 inches. Also offered for 1992 will be an economy model 630 roll-belt baler with bale width of 46.5 inches and diameters of 30 to 48 inches.

Payton said the current model 848 chain baler will remain in production for the 1992 season, but will be replaced in 1993 with a roll-belt baler.

He said the new design works well *in sandy and rocky conditions,* which was hard on the metal parts of the chain bale-forming systems. He said the new machines offer improvements in operator visibility, visual indicators for bale size, twine movement and the tailgate latch indicator.

As is typical of all belt balers, he said, the new machines take somewhat more operating horsepower than chain balers of the same size. ☐

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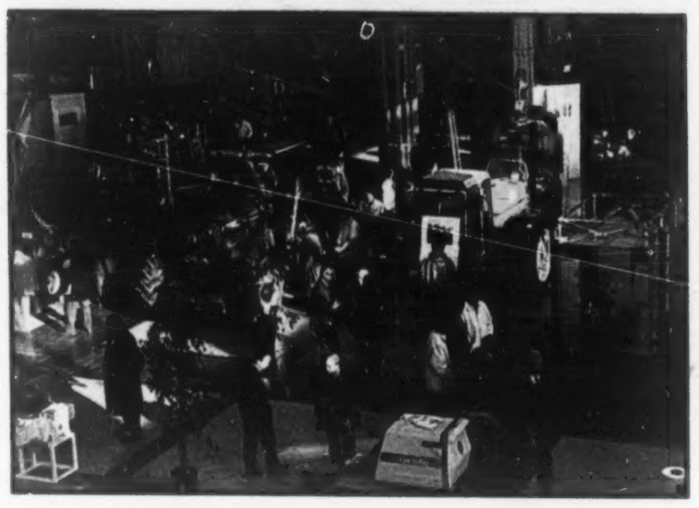

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JANUARY/FEBRUARY 1992

WALTER F. HANSSEN intends to follow the example his father set in building a John Deere dealership to establish a base for Belarus tractors, whose basic ruggedness he considers a virtue.

Selling Belarus To The West

By DAN BRYANT

THE COLLAPSE of the Soviet Union may spur the start of something big for Walter Hanssen.

Hanssen, president of California Farm Equipment, Inc., opened the first Belarus tractor dealership in California last August, and is banking on farmers taking to the Russian-made tractor the same way East-West politics entwined after the collapse of the Soviet Union.

The austere, low-tech, and bright red Belarus is essentially on a par with 1960s-vintage International or John Deere tractors. Hanssen sees the manual, non-electronic simplicity as a plus, since it translates to a purchase price that is generally half that of

(See BELARUS, pg. 14)

Editor's Notebook:

News Is Shaping Industry

By SCOTT NESBITT

A collection of news and some notes on what it might all mean:

Case Cuts 4,000 From Work Force

"The market has become a replacement market," explained Bob Carlson, the recently appointed president and CEO of the JI Case Co., division of Tenneco, Inc.

Because the market has changed, Case announced in December it was planning to cut costs and simplify corporate structure by removing 4,000 employees from payrolls during 1992. That would drop the worldwide work force from 25,000 to 21,000. The 4,000 came on top of 5,000 positions eliminated by Case since late 1990.

About half the cuts are slated for North America, the other half in Europe. Layoffs, early retirement and normal attrition will be used to trim all levels of the organization: hourly, salaried, managerial and executive.

In a memo circulated at Case, Carlson said, "Today's products incorporate higher levels of reliability and greater performance capability, yielding many more hours of useful life. . . the bulk of the fleet in customers' hands are equipped with operator comforts, modern transmissions and state-of-the-art hydraulics.

(See NOTEBOOK, pg. 3)

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NOTEBOOK

(From pg. 1)

"In a word, the agricultural customers in Western Europe and North America have modernized their fleets of tractors and combines, and there is no meaningful technology on the horizon that promises more comfort, more reliability, or more productivity at lower cost that will cause the farmer to trade prior to the end of a machine's useful life as defined by its first owner."

With the emphasis on replacing existing machines, rather than supplying new customers, the future holds lower annual unit sales of tractors and combines, and lower production schedules throughout the industry.

"We begin these work force reductions," Carlson said, "because there is no choice—we must size our company realistically to the new marketplace, and we must be profitable in order for our dealers and our customers to, in turn, be profitable."

Comment: The designers, engineers, production-line workers and other employees apparently did their job too well, and worked themselves out of their jobs at Case.

Can someone in private enterprise (government would mess it up) tap the talents of the state-of-the-art people who created machines so good they don't have to be replaced very often.

There's a world full of people craving the material things we North Americans take for granted, like comfortable, reliable tractors and durable field equipment. The former "evil empire" is ripe for modernization.

The Japanese have proved you can make money serving markets others abandon or ignore, like the market for small tractors and cars on this continent.

Case has been shrinking for years. The firm's 1989 annual claimed "more than 28,000 employees," while the 1990 report showed 27,800. Carlson's statement put the work force at 25,000, headed down to 21,000. That's about 25 percent since 1989. Decline has hit other "big name" farm and industrial machinery companies. Some declined so much they disappeared.

This current century witnessed, for the most part, the steady growth of machinery makers from small shops into world-spanning empires. Might the next 100 years be the century of the shortliner?

* * * * *

Case Picks Campbell As New President

JI Case Co. has announced that effective Jan. 1, 1992, the company's new president is Edward J. Campbell, a veteran of Tenneco operations.

Campbell takes over part of the job held by Bob Carlson, who had been serving as both president and chief executive officer.

Campbell had been president since 1979 of another Tenneco subsidiary, Newport News Shipbuilding, the largest privately-owned shipyard in the world, where revenues grew from $700 million in 1979 to $2 billion in 1990. He had also served as Case executive vice president for 11 years.

Carlson said Campbell is "going to play a major role in our restructuring and in our return to financial viability."

Comment: Carlson came from archrival Deere & Co. and knows how to make a profit their way. Campbell knows how to run things to make some money for Tenneco. The 1990 Tenneco annual report shows Newport News contributed 16 percent of Tenneco's operating income, and 15 percent of consolidated revenues. Case, in the same period, contributed less profit, 14 percent of income, while generating 37 percent of consolidated revenues.

With a new leader at Tenneco, Michael J. Walsh, expect a systematic shakeup through the Case organization.

There's been no indication in the Case corporate news that the company will want to trim the North American dealer network, which stands at about 450 in construction and 1,500 in ag machinery—but anything could happen.

* * * * *

Despite Deere's Downturn Regular Dividend Paid

The Deere & Co. board of directors announced on Dec. 11 that they would pay the regular quarterly dividend of 50 cents per share, payable Feb. 3, to shareholders of record on Dec. 31, 1991.

The day before the declaration, the company noted it was taking a one-time charge of $120 million to cover costs of cutting 2,100 jobs over the next two to three years, and closing a foundry. Because of that one-time charge, what would have been a profit of $99.8 million for the 1991 fiscal year became a loss of $20.2 million—which equates to a loss of 27 cents per share for the fiscal year that ended October 31.

Hans W. Becherer, Deere's chairman and CEO, forecast a flat market for the near future, saying "initial 1992 worldwide production, in tons, is scheduled to be about the same as the company's actual 1991 output...agricultural production is scheduled to be down modestly from last year, but offset by increases in lawn and grounds care equipment and industrial equipment schedules."

Becherer declared that "although the economic fundamentals of North American agriculture remain relatively strong, we expect farms to remain cautious in making new product purchase decisions in 1992. Consequently, domestic agricultural machinery retail sales are expected to remain near 1991 levels."

Comment: Is it meaningful that the

(See NOTEBOOK, pg. 13)

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INDUSTRY NEWS

Season Ends With Sales Low, Inventories High

FARM machinery sales reports from the United States and Canada continued painting a gloomy picture through November, with the only upturn category coming from improved sales (nearly 7 percent) self-propelled combines north of the border, according to the Canadian Farm & Industrial Equipment Institute.

Reports from the Equipment Manufacturers Institute show U.S. inventories remaining high as winter approached, a situation reflected in factory cutbacks announced by major producers. ☐

U.S. - UNIT RETAIL SALES

Equipment	November 1991	November 1990	November % Change	January-November 1991	January-November 1990	January-November % Change	October 1991 Inventory N.A. Factory & U.S. Field
Farm Wheel Tractors:							
2-Wheel Drive							
Under 40 HP	1,663	2,231	(25.5)	34,004	39,846	(14.7)	31,659
40 & Under 100 HP	1,991	2,441	(18.4)	31,698	35,558	(10.9)	21,874
100 HP & Over	1,550	1,948	(20.4)	17,996	19,222	(6.4)	14,294
Total 2-Wheel Drive	**5,204**	**6,620**	**(21.4)**	**83,698**	**94,626**	**(11.5)**	**67,827**
Total 4-Wheel Drive	**242**	**522**	**(53.6)**	**3,723**	**4,669**	**(20.3)**	**2,238**
Total Farm Wheel Tractors	**5,446**	**7,142**	**(23.7)**	**87,421**	**99,295**	**(12.0)**	**70,065**
Combines:							
(Self-Propelled)	1,010	1,211	(16.6)	8,833	9,352	(5.5)	5,331

These data are, in part, estimates which are subject to revisions when final detail data become available. Because of the seasonal nature of the industry comparisons of monthly data from one period to another should be done with extreme caution. These data represent most, but not all, of the manufacturers in each product category being sold at retail in the fifty states and the District of Columbia.

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U.S. - UNIT RETAIL SALES

Equipment	December 1991	December 1990	December % Change	January-December 1991	January-December 1990	January-December % Change	November 1991 Inventory N.A. Factory & U.S. Field
Farm Wheel Tractors:							
2-Wheel Drive							
Under 40 HP	1,874	2,215	(15.4)	35,895	42,061	(14.7)	32,078
40 & Under 100 HP	2,225	2,863	(22.3)	33,891	38,421	(11.8)	21,777
100 HP & Over	2,128	3,569	(40.4)	20,119	22,791	(11.7)	14,089
Total 2-Wheel Drive	**6,227**	**8,647**	**(28.0)**	**89,905**	**103,273**	**(12.9)**	**67,944**
Total 4-Wheel Drive	**386**	**433**	**(10.9)**	**4,069**	**5,102**	**(20.2)**	**2,482**
Total Farm Wheel Tractors	**6,613**	**9,080**	**(27.2)**	**93,974**	**108,375**	**(13.3)**	**70,426**
Combines:							
(Self-Propelled)	880	1,081	(18.6)	9,715	10,433	(6.9)	5,253

Canada Report Retail Sales In Units

EQUIPMENT	October 1991	October 1990	% Chg.	October/Ytd 1991	October/Ytd 1990	% Chg.
FARM WHEEL TRACTORS						
2WD under 40 H.P.	237	295	-19.7%	2,351	3,128	-24.8%
2WD 40-99 H.P.	659	832	-20.8%	4,874	5,876	-17.1%
2WD 100 H.P. & Over	291	341	-14.7%	2,121	2,127	-0.3%
Total 2WD	**1,187**	**1,468**	**-19.1%**	**9,346**	**11,131**	**-16.0%**
Total 4WD	**165**	**160**	**3.1%**	**1,233**	**1,392**	**-11.4%**
TOTAL FARM WHEEL TRACTORS:	**1,352**	**1,628**	**-17.0%**	**10,579**	**12,523**	**-15.5%**
COMBINES						
Self Propelled	244	295	-17.3%	1,350	1,263	6.9%
Pull Type	17	23	-26.1%	108	164	-34.1%
BALERS						
Rectangular Balers	57	70	-18.6%	700	1,087	-35.6%
Round Balers	258	299	-13.7%	3,080	3,539	-13.0%
SWATHERS						
Self Propelled	62	60	3.3%	654	693	-5.6%
Pull Type	42	72	-41.7%	670	1,138	-41.1%
FORAGE HARVESTERS						
Shear Bar Type	38	53	-28.3%	419	497	-15.7%
MOWER CONDITIONERS	**174**	**174**	**0.0%**	**2,778**	**3,160**	**-12.1%**

Canada Report Retail Sales In Units

EQUIPMENT	November 1991	November 1990	% Chg.	November/Ytd 1991	November/Ytd 1990	% Chg.
FARM WHEEL TRACTORS						
2WD under 40 H.P.	210	231	-9.1%	2,562	3,359	-23.7%
2WD 40-99 H.P.	390	500	-22.0%	5,253	6,376	-17.6%
2WD 100 H.P. & Over	129	149	-13.4%	2,257	2,276	-0.8%
Total 2WD	**729**	**880**	**-17.2%**	**10,072**	**12,011**	**-16.1%**
Total 4WD	**70**	**96**	**-27.1%**	**1,303**	**1,488**	**-12.4%**
TOTAL FARM WHEEL TRACTORS:	**799**	**976**	**-18.1%**	**11,375**	**13,499**	**-15.7%**
COMBINES						
Self Propelled	65	64	-1.6%	1,417	1,327	6.8%
Pull Type	4	10	-60.0%	112	174	-35.6%
BALERS						
Rectangular Balers	32	57	-43.9%	733	1,144	-35.9%
Round Balers	79	89	-11.2%	3,159	3,628	-12.9%
SWATHERS						
Self Propelled	39	31	25.8%	693	724	-4.3%
Pull Type	21	19	-10.5%	691	1,157	-40.3%
FORAGE HARVESTERS						
Shear Bar Type	28	16	-75.0%	447	513	-12.9%
MOWER CONDITIONERS	**110**	**118**	**-6.8%**	**2,888**	**3,278**	**-11.9%**

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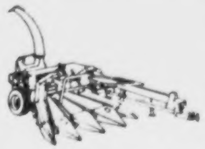

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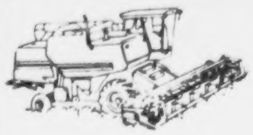

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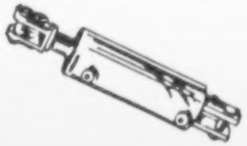

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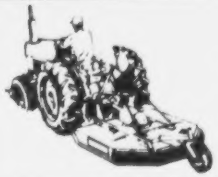

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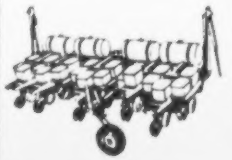

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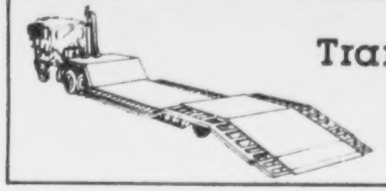

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Abbreviations:
DNA — Does not apply.
NA — Not available.
Std. — Standard.
Opt. — Optional
Linear measurements may be to nearest ¼-inch.

For addresses of manufacturers whose products are listed in this edition, refer first to advertiser's index and obtain address from advertisement. For non-advertisers and companies that do not show an address on their advertisement, refer to company name and address listing in I&T PRODUCT FILE (Annual October 31 issue).

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Nebraska Test Procedures

General

Tractors are tested at the University of Nebraska according to the Agricultural Tractor Test Code approved by the American Society of Agricultural Engineers and the Society of Automotive Engineers or official Nebraska test procedure.

The manufacturer selects the tractor to be tested and certifies that it is a stock model. Each tractor is equipped with the common power consuming accessories such as power steering, power lift pump, generator, etc., if available. Power consuming accessories may be disconnected only when the means for disconnecting can be reached from the operating station. An official representative of the company is present during the test to see that the tractor gives its optimum performance. Additional weight may be added to the tractor as ballast if the manufacturer recommends use of such ballast. The static tire loads and the tire inflation pressures must conform to the specifications of Tire and Rim Association.

Preparation for Test

The engine crankcase is drained and refilled with new oil conforming to specifications in the operator's manual. The operator's manual is also used as the guide for selecting the proper fuel and for routine lubrication and maintenance operations.

The tractor is limbered up for a minimum of three hours on the drawbar. Preliminary adjustments of the tractor is permitted at this time. Any parts added or replaced during the limber-up run, or any subsequent runs, are mentioned in the individual test reports. The tractor is equipped with approximately the amount of added ballast that is to be used during the drawbar runs.

PTO Performance

Power take-off performance runs are made by connecting the power take-off to a dynamometer. During a preliminary power take-off the manufacturer's representative may make adjustment for the fuel, ignition or injection timing and governor control settings. The settings must be maintained for the remainder of the test. The manually operated governor control mechanism is set to provide the high-idle speed specified by the manufacturer. During the power take-off runs an ambient air temperature of approximately 75 degrees F. (24.0 degrees C) is maintained.

Maximum power is obtained at the rated engine speed specified by the manufacturer with the governor control set for maximum power. This same setting is used for all subsequent PTO runs. Time of the run is two hours. Whenever the power take-off speed during the maximum power run differs from the speeds set forth in the ASAE and SAE standards, an additional run is made at either 540 or 1000 rpm of the power take-off shaft. Time of this run is one hour.

Drawbar Performance

Maximum drawbar power is shown for the normal field speed selected by the manufacturer. All engine adjustments are the same as those used in the power take-off runs. If the manufacturer specifies a different rated engine speed for drawbar operations, then the position of the manually operated governor control is changed to provide the high-idle speed specified.

Maximum drawbar power is determined within the following limits: (1) slip of the drivers must not exceed 15 percent for pneumatic tires on the concrete test course or 7 percent for steel cleats on the well packed earthen course; (2) ground speeds must not exceed 10 miles per hour; (3) safe stability limits of the tractor must not be exceeded; (4) no other operating limit of the tractor must be exceeded. Drawbar load is applied until the manufacturer's rated engine speed is obtained with maximum governor control lever setting. Travel speed, drawbar pull and other data are recorded over two 500-foot straight level areas.

Fuel consumption is determined at the manufacturer's selected travel speed with the drawbar pull set: (1) to give rated engine rpm; (2) 75 percent of the pull at rated engine rpm; (3) 50 percent of the pull at rated engine rpm; and (4) maintaining the same load and travel speed as in (3) by shifting to a higher gear and reducing the engine rpm.

This summary shows the drawbar horsepower, corresponding travel speed and duel consumption at 100 percent, 75 percent, or 50 percent loads, and 50 percent of pull at reduced engine speed.

Also shown is the maximum drawbar horsepower produced for two 500-foot travel sections and corresponding travel speed, the maximum drawbar pull and the corresponding drive-wheel slippage.

In addition, the "lugging ability" obtained by increasing the load so that the full throttle engine speed drops to 80 percent of rated is given as a percent increase with respect to the pull at rated engine rpm.

The maximum drawbar horsepower and the corresponding speed and drawbar pull for other selected gears or travel speeds are shown in the individual test reports.

Sound Measurement

Sound is recorded during each of the Drawbar Performance runs as the tractor travels on a straight section of the test course. The dB(A) sound level is obtained with the microphone located near the right ear of the operator. Bystander sound readings are taken with the microphone placed 25 feet (7.5 meters) from the line of travel of the tractor.

An increase of 10 dB(A) will approximately double the loudness to the human ear.

SUMMARY OF OECD TEST 1128—NEBRASKA SUMMARY 043
CASE INTERNATIONAL 9170 DIESEL
ALSO STEIGER PANTHER 1000 DIESEL
ALSO CASE INTERNATIONAL 9270 DIESEL
ALSO STEIGER 9270 DIESEL
12 SPEED

POWER TAKE-OFF PERFORMANCE

Power HP (kW)	Crank shaft speed rpm	Fuel Consumption Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Mean Atmospheric Conditions
MAXIMUM POWER AND FUEL CONSUMPTION					
Rated Engine Speed—(PTO speed—1001 rpm)					
308.1 *(229.9)*	2099	16.9 *(64.0)*	0.395 *(0.240)*	18.23 *(3.59)*	
Maximum Power (2 hour test)					
330.2 *(246.2)*	1800	16.9 *(64.1)*	0.368 *(0.224)*	19.49 *(3.84)*	Air temperature
VARYING POWER AND FUEL CONSUMPTION					79°F *(26°C)*
308.1 *(229.9)*	2099	16.9 *(64.0)*	0.395 *(0.240)*	18.23 *(3.59)*	
269.9 *(201.3)*	2165	15.5 *(58.8)*	0.413 *(0.251)*	17.37 *(3.42)*	Relative humidity
205.0 *(153.0)*	2190	13.2 *(49.8)*	0.460 *(0.280)*	15.57 *(3.07)*	21%
138.5 *(103.2)*	2217	9.6 *(36.2)*	0.496 *(0.301)*	14.48 *(2.85)*	Barometer
70.1 *(52.3)*	2247	7.0 *(26.5)*	0.716 *(0.435)*	10.03 *(1.98)*	30.20" Hg *(102.3 kPa)*
6.9 *(5.2)*	2292	4.5 *(17.1)*	4.669 *(2.839)*	1.54 *(0.30)*	

Maximum Torque 1176.5 lb.-ft. *(1595.1 Nm)* @ 1500 RPM
Maximum Torque Rise 53%

DRAWBAR PERFORMANCE

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temp °F (°C) cool-ing med	Air dry bulb	Barom. inch Hg (kPa)
75% of Pull at Maximum Power—Five Hours 7th Gear									
256.55 *(191.24)*	14350 *(63.83)*	6.70 *(10.78)*	2140	3.03	0.470 *(0.286)*	15.21 *(3.00)*	185 *(85)*	82 *(28)*	29.90 *(101.0)*
MAXIMUM POWER IN SELECTED GEARS									
3rd Gear									
242.84 *(181.16)*	34580 *(153.82)*	2.63 *(4.23)*	2077	14.89	0.500 *(0.304)*	14.22 *(2.80)*	183 *(84)*	77 *(25)*	29.87 *(100.9)*
4th Gear									
258.39 *(192.68)*	34140 *(151.86)*	2.84 *(4.57)*	1801	13.17	0.477 *(0.290)*	14.99 *(2.95)*	187 *(86)*	82 *(28)*	29.87 *(100.9)*
5th Gear									
274.51 *(204.70)*	26810 *(119.25)*	3.84 *(6.18)*	1900	8.21	0.449 *(0.273)*	15.92 *(3.14)*	187 *(86)*	81 *(27)*	29.87 *(100.9)*
6th Gear									
279.79 *(208.72)*	21600 *(96.08)*	4.86 *(7.82)*	1801	5.75	0.440 *(0.268)*	16.25 *(3.20)*	187 *(86)*	79 *(26)*	29.87 *(100.9)*
7th Gear									
282.07 *(210.42)*	19100 *(84.97)*	5.54 *(8.91)*	1801	4.78	0.432 *(0.263)*	16.46 *(3.24)*	187 *(86)*	79 *(26)*	29.87 *(100.9)*
8th Gear									
281.48 *(209.99)*	15720 *(69.93)*	6.72 *(10.81)*	1802	3.75	0.420 *(0.256)*	16.92 *(3.33)*	187 *(86)*	79 *(26)*	29.87 *(100.9)*

Location of Test: J I Case Company, 3101 1st Avenue North, Fargo, North Dakota 58102

Dates of Test: April to July, 1987

Manufacturer: J I Case Company, 700 State Street, Racine, Wisconsin 53404 U.S.A.

FUEL AND OIL: Fuel No. 2 Diesel **Cetane No.** 40 min **Specific gravity converted to 60°/60°F** *(15°/15°C)* 0.859 **Fuel weight** 7.15 lbs/gal *(0.857 kg/l)* **Oil SAE** 15W40 **Oil Consumption for 10 hours** 0.15 lb *(70 gm)* **Transmission lubricant** Case IH transmission oil 02-7408 I I **Final drive lubricant** SAE 80W90 gear oil API GL-5

ENGINE: Make Cummins Diesel **Type** six cylinder vertical with turbocharger and intercooler **Serial No.** 11385464 **Crankshaft** lengthwise **Rated engine speed** 2100 **Bore and stroke** 5.5" × 6.0" *(140 mm × 152 mm)* **Compression ratio** 14.5 to 1 **Displacement** 855 cu in *(14013 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements and aspirator **Oil filter** one full flow cartridge and one bypass cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** two paper cartridges **Muffler** vertical **Cooling medium temperature control** thermostat

CHASSIS: Type four wheel drive with duals **Serial No.** 17900706 **Tread width** rear 80" *(2032 mm)* and 137" *(3480 mm)* front 80" *(2032 mm)* and 137" *(3480)* **Wheel base** 141.5" *(3594 mm)* **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with full range operator controlled powershift **Nominal travel speeds mph** *(km/h)* first 2.0 *(3.2)* second 2.5 *(4.0)* third 3.0 *(4.8)* fourth 3.7 *(5.9)* fifth 4.4 *(7.1)* sixth 5.5 *(8.9)* seventh 6.5 *(10.5)* eighth 7.8 *(12.5)* ninth 9.6 *(15.4)* tenth 11.7 *(18.8)* eleventh 14.1 *(22.7)* twelfth 17.3 *(27.8)* reverse 2.7 *(4.3)*, 4.8 *(7.7)* **Clutch** multiple wet disc hydraulically power actuated by foot pedal **Brakes** dual caliper disc hydraulically operated by foot pedal **Steering** hydrostatic and articulated **Power take-off** 1000 rpm at 2099 engine rpm **Unladen tractor mass** 33970 lb *(15405 kg)* (with duals)

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

TRACTOR SOUND LEVEL WITH CAB	dB(A)
Maximum sound level	79.0
Bystander in 12th gear	95.0

CENTER OF GRAVITY

Horizontal distance forward from centerline of rear wheels	74.8" in *(1900 mm)*
Vertical distance above roadway	53.8" in *(1366 mm)*
Horizontal distance from center of rear wheel tread 0" to the right/left	

TURNING ON A CONCRETE SURFACE

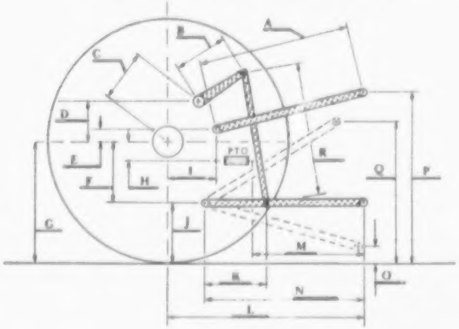
Turning radius—with duals right 276" *(7.01 m)* left 277" *(7.03 m)*
Turning space radius—with duals right 290" *(7.37 m)* left 289" *(7.35 m)*

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi *(kPa)*	Four 23.1-34, 8; inner 16 *(110)* outer 14 *(96)*	Four 23.1-34, 8; inner 14 *(96)* outer 12 *(82)*
Ballast	—Liquid (total)	None	None
Front Tires	—No., size, ply & psi *(kPa)*	Four 23.1-34, 8; inner 16 *(110)* outer 14 *(96)*	Four 23.1-34, 8; inner 14 *(96)* outer 12 *(82)*
Ballast	—Liquid (total)	3540 lb *(1605 kg)*	None
Height of Drawbar		14.0 in *(355 mm)*	13.7 in *(349 mm)*
Static Weight	—Rear	16020 lb *(7265 kg)*	16020 lb *(7265 kg)*
	—Front	21490 lb *(9745 kg)*	17950 lb *(8140 kg)*
	—Total	37510 lb *(17010 kg)*	33970 lb *(15405 kg)*

THREE POINT HITCH PERFORMANCE (STATIC TEST)

CATEGORY: IV-N	
Quick Attach: None	
Maximum Force Exerted Through Whole Range	15990 lbs *(71.1 kN)*
i) Opening pressure of relief valve	NA
Sustained pressure at the compensator cutoff	2531 psi *(175 Bar)*
ii) Pump delivery rate at minimum pressure and rated engine speed	31.0 GPM *(117.3 l/min)*
iii) Pump delivery rate at maximum hydraulic power	27.3 GPM *(103.3 l/min)*
Delivery pressure	2120 psi *(146 Bar)*
Power	33.9 Hp *(25.3 kW)*

HITCH DIMENSIONS AS TESTED—NO LOAD



	inch	mm
A	30.5	*774*
B	21.0	*533*
C	27.8	*706*
D	23.7	*601*
E	11.0	*280*
F	13.6	*345*
G	32.2	*818*
H	2.9	*74*
I	21.0	*535*
J	18.6	*473*
K	25.7	*652*
L	51.1	*1299*
M	26.1	*664*
N	39.3	*997*
O	8.6	*219*
P	45.6	*1158*
Q	39.3	*999*
R	35.9	*913*

REMARKS: All test results were determined from observed data obtained in accordance with official OECD test procedures. The Case International 9170 is identical to the Steiger Panther 1000 (Cummins powered) except with regard to color and model designation.

The performance figures on this summary were taken from a test conducted under the OECD standard test code procedure.

We, the undersigned, certify that this is a true summary of data from OECD Report No. **1128**, Nebraska Summary 043, May 20, 1988.

Report reissued. Supplemental permit for models Case International 9270 and Steiger 9270, May 25, 1991.

LOUIS I. LEVITICUS
Engineer-in-Charge

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Board of Tractor Test Engineers

Agricultural Research Division
Institute of Agriculture and Natural Resources
University of Nebraska-Lincoln
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SUMMARY OF OECD TEST 1129—NEBRASKA SUMMARY 044
CASE INTERNATIONAL 9180 DIESEL
ALSO STEIGER LION 1000 DIESEL
ALSO CASE INTERNATIONAL 9280 DIESEL
ALSO STEIGER 9280 DIESEL
12 SPEED

POWER TAKE-OFF PERFORMANCE

Power HP (kW)	Crank shaft speed rpm	Fuel Consumption Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Mean Atmospheric Conditions
MAXIMUM POWER AND FUEL CONSUMPTION					
Rated Engine Speed—(PTO speed—1000 rpm)					
344.5 *(257.0)*	2099	19.0 *(71.9)*	0.395 *(0.240)*	18.14 *(3.57)*	
Maximum Power (2 hour test)					
363.3 *(271.0)*	1799	18.8 *(71.3)*	0.372 *(0.226)*	19.28 *(3.80)*	Air temperature
VARYING POWER AND FUEL CONSUMPTION					
344.5 *(257.0)*	2099	19.0 *(71.9)*	0.395 *(0.240)*	18.14 *(3.57)*	84°F *(29°C)*
302.2 *(225.4)*	2167	17.6 *(66.7)*	0.418 *(0.254)*	17.15 *(3.38)*	Relative humidity
229.6 *(171.3)*	2195	14.3 *(54.3)*	0.448 *(0.272)*	16.01 *(3.16)*	24%
154.9 *(115.6)*	2221	11.4 *(43.1)*	0.527 *(0.320)*	13.61 *(2.68)*	Barometer
78.5 *(58.6)*	2252	8.0 *(30.3)*	0.735 *(0.447)*	9.76 *(1.92)*	30.98" Hg *(104.6 kPa)*
2.7 *(2.0)*	2302	5.4 *(20.6)*	14.345 *(8.723)*	0.51 *(0.10)*	

Maximum Torque 1234.8 lb.-ft. *(1674.2 Nm)* @ 1300 RPM
Maximum Torque Rise 43%

DRAWBAR PERFORMANCE

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temp °F (°C) cooling med	Air dry bulb	Barom. inch Hg (kPa)
75% of Pull at Maximum Power—Five Hours 6th Gear									
286.42 *(213.59)*	17650 *(78.51)*	6.09 *(9.80)*	2160	4.02	0.480 *(0.292)*	14.87 *(2.93)*	180 *(82)*	64 *(18)*	30.17 *(101.9)*
MAXIMUM POWER IN SELECTED GEARS									
3rd Gear									
275.51 *(205.38)*	36050 *(160.35)*	2.87 *(4.61)*	2077	15.01	0.491 *(0.298)*	14.52 *(2.86)*	183 *(84)*	75 *(24)*	29.89 *(100.9)*
4th Gear									
295.93 *(220.76)*	33670 *(149.78)*	3.30 *(5.31)*	1868	11.27	0.449 *(0.273)*	15.89 *(3.13)*	187 *(86)*	77 *(25)*	29.88 *(100.9)*
5th Gear									
305.56 *(227.80)*	27440 *(122.06)*	4.17 *(6.72)*	1901	7.97	0.442 *(0.269)*	16.09 *(3.17)*	187 *(86)*	77 *(25)*	29.88 *(100.9)*
6th Gear									
311.16 *(232.13)*	23540 *(104.71)*	4.96 *(7.98)*	1801	6.27	0.435 *(0.265)*	16.34 *(3.22)*	190 *(88)*	77 *(25)*	29.88 *(100.9)*
7th Gear									
314.89 *(234.91)*	19710 *(87.67)*	5.99 *(9.65)*	1801	4.86	0.430 *(0.262)*	16.55 *(3.26)*	190 *(88)*	81 *(27)*	29.90 *(101.0)*
8th Gear									
315.86 *(235.63)*	16390 *(72.89)*	7.23 *(11.64)*	1792	3.79	0.426 *(0.259)*	16.75 *(3.30)*	189 *(87)*	81 *(27)*	29.90 *(101.0)*
9th Gear									
311.58 *(232.29)*	12240 *(54.43)*	9.55 *(15.36)*	1898	2.63	0.437 *(0.266)*	16.30 *(3.21)*	189 *(87)*	81 *(27)*	29.90 *(101.0)*

Location of Test: J I Case Company, 3101 1st Avenue North, Fargo, North Dakota 58102

Dates of Test: April to August, 1987

Manufacturer: J I Case Company, 700 State Street, Racine, Wisconsin 53404 U.S.A.

FUEL AND OIL: Fuel No. 2 Diesel **Cetane No.** 40 min **Specific gravity converted to 60°/60°F** *(15°/15°C)* 0.859 **Fuel weight** 7.15 lbs/gal *(0.857 kg/l)* **Oil** SAE 15W40 **Oil Consumption for 10 hours** 0.09 lb *(40 gm)* **Transmission lubricant** Case IH transmission oil 02-7408T1 **Final drive lubricant** SAE 80W90 gear oil API GL-5

ENGINE: Make Cummins Diesel **Type** six cylinder vertical with turbocharger and intercooler **Serial No.** 11385474 **Crankshaft** lengthwise **Rated engine speed** 2100 **Bore and stroke** 5.5" × 6.0" *(140 mm × 152 mm)* **Compression ratio** 14.0 to 1 **Displacement** 855 cu in *(14013 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements and aspirator **Oil filter** one full flow cartridge and one bypass cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** two paper cartridges **Muffler** vertical **Cooling medium temperature control** thermostat

CHASSIS: Type four wheel drive with duals **Serial No.** 17900712 **Tread width** rear 76.2" *(1935 mm)* and 132.3" *(3360 mm)* front 76.2" *(1935 mm)* and 132.3" *(3360 mm)* **Wheel base** 141.5" *(3594 mm)* **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with full range operator controlled powershift **Nominal travel speeds mph (km/h)** first 2.2 *(3.5)* second 2.6 *(4.2)* third 3.3 *(5.3)* fourth 4.0 *(6.4)* fifth 4.8 *(7.7)* sixth 6.0 *(9.6)* seventh 7.1 *(11.4)* eighth 8.5 *(13.7)* ninth 10.5 *(16.9)* tenth 12.8 *(20.6)* eleventh 15.4 *(24.8)* twelfth 19.0 *(30.6)* reverse 2.9 *(4.7)*, 5.3 *(8.5)* **Clutch** multiple wet disc hydraulically power actuated by foot pedal **Brakes** dual caliper disc hydraulically operated by foot pedal **Steering** hydrostatic and articulated **Power take-off** 1000 rpm at 2099 engine rpm **Unladen tractor mass** 35570 lb *(16140 kg)* (with duals)

REPAIRS AND ADJUSTMENTS: No repairs or adjustments

TRACTOR SOUND LEVEL WITH CAB	dB(A)
Maximum sound level	81.0
Bystander in 12th gear	95.0

CENTER OF GRAVITY

Horizontal distance forward from centerline of rear wheels	75.5" in *(1918 mm)*
Vertical distance above roadway	55.9" in *(1421 mm)*
Horizontal distance from center of rear wheel tread 0" to the right/left	

TURNING ON A CONCRETE SURFACE

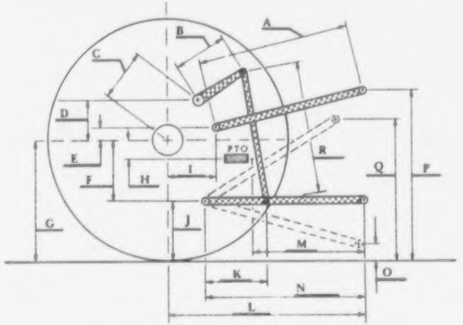
Turning radius—with duals right 271" *(6.88 m)* left 275" *(6.99 m)*
Turning space radius—with duals right 284" *(7.20 m)* left 288" *(7.31 m)*

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi *(kPa)*	Four 20.8-42; 10; inner 18 *(124)* outer 16 *(110)*	Four 20.8-42; 10; inner 14 *(96)* outer 12 *(82)*
Ballast	—Liquid (total)	None	None
Front Tires	—No., size, ply & psi *(kPa)*	Four 20.8-42; 10; inner 18 *(124)* outer 16 *(110)*	Four 20.8-42; 10; inner 14 *(96)* outer 12 *(82)*
Ballast	—Liquid (total)	4320 lb *(1960 kg)*	None
Height of Drawbar		17.0 in *(433 mm)*	16.5 in *(420 mm)*
Static Weight	—Rear	16790 lb *(7620 kg)*	16790 lb *(7620 kg)*
	—Front	23100 lb *(10480 kg)*	18780 lb *(8520 kg)*
	—Total	39890 lb *(18100 kg)*	35570 lb *(16140 kg)*

THREE POINT HITCH PERFORMANCE (STATIC TEST)

CATEGORY IV N	
Quick Attach None	
Maximum Force Exerted Through Whole Range	16520 lbs *(73.5 kN)*
i) Opening pressure of relief valve	NA
Sustained pressure at the compensator cutoff	2531 psi *(175 Bar)*
ii) Pump delivery rate at minimum pressure and rated engine speed	31.0 GPM *(117.3 l/min)*
iii) Pump delivery rate at maximum hydraulic power	27.4 GPM *(103.7 l/min)*
Delivery pressure	2120 psi *(146 Bar)*
Power	33.9 Hp *(25.3 kW)*

HITCH DIMENSIONS AS TESTED—NO LOAD



Hitch Dimensions as Tested — No Load

	inch	mm
A	30.5	*774*
B	21.0	*533*
C	27.8	*706*
D	23.7	*601*
E	11.0	*280*
F	13.6	*345*
G	35.0	*889*
H	2.9	*74*
I	21.0	*535*
J	21.4	*544*
K	25.7	*652*
L	51.1	*1299*
M	26.1	*664*
N	39.3	*997*
O	8.8	*224*
P	48.4	*1230*
Q	39.4	*1001*
R	37.6	*956*

REMARKS: All test results were determined from observed data obtained in accordance with official OECD test procedures. The Case International 9180 is identical to the Steiger Lion 1000 (Cummins powered) except with regard to color and model designation.

The performance figures on this summary were taken from a test conducted under the OECD standard test code procedure.

We, the undersigned, certify that this is a true summary of data from OECD Report No. **1129,** Nebraska Summary 044, May 20, 1988.

Report reissued. Supplemental permit for models Case International 9280 and Steiger 9280, May 25, 1991.

LOUIS I. LEVITICUS
Engineer-in-Charge

K. VON BARGEN
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Board of Tractor Test Engineers

Agricultural Research Division
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University of Nebraska–Lincoln
Dale H. Vanderholm, Dean and Director

SUMMARY OF OECD TEST 1251—NEBRASKA SUMMARY 078
FORD VERSATILE 276 DIESEL
HYDROSTATIC

POWER TAKE-OFF PERFORMANCE

Power HP (kW)	Crank shaft speed rpm	Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Mean Atmospheric Conditions
MAXIMUM POWER AND FUEL CONSUMPTION					
Rated Engine Speed—(PTO speed—1025 rpm)					
106.7 *(79.6)*	2500	6.68 *(25.3)*	0.434 *(0.264)*	16.19 *(3.19)*	
VARYING POWER AND FUEL CONSUMPTION					
106.7 *(79.6)*	2500	6.68 *(25.3)*	0.434 *(0.264)*	16.19 *(3.19)*	Air temperature
96.3 *(71.8)*	2653	6.71 *(25.4)*	0.490 *(0.298)*	14.31 *(2.82)*	57°F *(14°C)*
73.2 *(54.6)*	2681	5.47 *(20.7)*	0.521 *(0.317)*	13.45 *(2.65)*	Relative humidity
48.9 *(36.5)*	2707	4.62 *(17.5)*	0.661 *(0.402)*	10.61 *(2.09)*	94%
24.5 *(18.3)*	2714	3.57 *(13.5)*	1.011 *(0.615)*	6.95 *(1.37)*	Barometer
1.3 *(1.0)*	2757	2.56 *(9.7)*	15.496 *(9.426)*	0.56 *(0.11)*	29.71" Hg *(100.6 kPa)*

Maximum Torque 320.1 lb.-ft. *(434.1 Nm)* at 1600 RPM
Maximum Torque Rise 23.1%

DRAWBAR PERFORMANCE
FUEL CONSUMPTION CHARACTERISTICS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp °F (°C) cool ing med	Temp °F (°C) Air dry bulb	Barom inch Hg (kPa)
Maximum Power—1st Gear									
70.4 *(52.5)*	5260 *(23.4)*	5.01 *(8.07)*	2480	6.9	0.651 *(0.396)*	10.76 *(2.12)*	187 *(86)*	81 *(27)*	29.77 *(100.8)*
75% of Pull at Maximum Power—1st Gear									
60.9 *(45.4)*	3980 *(17.7)*	5.74 *(9.24)*	2674	5.9	0.656 *(0.399)*	10.66 *(2.10)*	185 *(85)*	75 *(24)*	29.77 *(100.8)*
50% of Pull at Maximum Power—1st Gear									
42.5 *(31.7)*	2655 *(11.8)*	6.02 *(9.69)*	2698	3.0	0.819 *(0.498)*	8.63 *(1.70)*	183 *(84)*	75 *(24)*	29.77 *(100.8)*
75% of Pull at Reduced Engine Speed—2nd Gear									
59.8 *(44.6)*	3955 *(17.6)*	5.66 *(9.11)*	1942	4.0	0.566 *(0.344)*	12.39 *(2.44)*	183 *(84)*	75 *(24)*	29.77 *(100.8)*
50% of Pull at Reduced Engine Speed—2nd Gear									
42.0 *(31.3)*	2630 *(11.7)*	5.99 *(9.64)*	1949	2.2	0.658 *(0.400)*	10.66 *(2.10)*	181 *(83)*	75 *(24)*	29.77 *(100.8)*

Location of Test: Prairie Agricultural Machinery Institute, P.O. Box 1060, Portage La Prairie, Manitoba, Canada R1N 3C5

Dates of Test: June 1989

Manufacturer: VERSATILE FARM EQUIPMENT OPERATIONS, Ford New Holland Canada Ltd, Box 7300, 1260 Clarence Avenue, Winnipeg, Manitoba, Canada R3C 4E8

FUEL and OIL: Fuel No. 1 Diesel **Cetane No.** NA **Specific gravity converted to 60°/60°F** *(15°/15°C)* 0.85 **Fuel weight** 7.01 lb/gal *(0.84 kg/l)* **Oil** SAE 10W30 **Oil consumption for 10 hours** NA **Transmission lubricant** Versatile Hygear 23 **Hydrostatics lubricant** Dexron II ATF **Final drive lubricant** SAE 80W90 API GL-5

ENGINE: Make Ford Diesel **Type** four cylinder vertical with turbocharger **Serial No.** 36434 **Crankshaft** lengthwise **Rated engine speed** 2500 **Bore and stroke** 4.4" × 4.4" *(112 mm × 112 mm)* **Compression ratio** 17 to 1 **Displacement** 268 cu in *(4392 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements **Oil filter** one full flow cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydrostatics oil **Fuel filter** one paper element and water separator **Muffler** vertical **Cooling medium temperature control** thermostat

CHASSIS: Type four wheel drive **Serial No.** 276-89-D432128 **Tread width** rear 63.4" *(1610 mm)* to 95.3" *(2421 mm)* front 63.4" *(1610 mm)* to 95.3" *(2421 mm)* **Wheel base** 86.0" *(2180 mm)* **Hydraulic control system** direct engine drive **Transmission** infinitely variable hydrostatic using a variable displacement pump and a fixed displacement motor, plus a three speed manual transmission **Nominal travel speeds mph (km/h)** forward 0-5.5 *(0-8.9)*, 0-7.7 *(0-12.4)*, 0-17.9 *(0-28.9)* reverse 0-5.5 *(0-8.9)*, 0-7.7 *(0-12.4)*, 0-17.9 *(0-28.9)* **Clutch** none **Brakes** caliper disc hydraulically operated by foot pedal **Steering** hydrostatic and articulated **Power take-off** 540 rpm at 2417 engine rpm or 1000 rpm at 2436 engine rpm **Unladen tractor mass** 9400 lb *(4272 kg)*

DRAWBAR PERFORMANCE
MAXIMUM POWER AT SELECTED SPEEDS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp °F (°C) cool ing med	Temp °F (°C) Air dry bulb	Barom inch Hg (kPa)
1st Gear									
33.5 *(25.0)*	8095 *(36.0)*	1.6 *(2.5)*	2698	15.0	1.013 *(0.616)*	6.90 *(1.36)*	183 *(84)*	72 *(22)*	29.77 *(100.8)*
1st Gear									
45.7 *(34.1)*	7890 *(35.1)*	2.2 *(3.5)*	2667	15.0	0.858 *(0.522)*	8.17 *(1.61)*	183 *(84)*	72 *(22)*	29.77 *(100.8)*
1st Gear									
61.8 *(46.1)*	7465 *(33.2)*	3.1 *(5.0)*	2633	15.5	0.733 *(0.446)*	9.56 *(1.88)*	187 *(86)*	73 *(23)*	29.77 *(100.8)*
1st Gear									
71.2 *(53.1)*	6610 *(29.4)*	4.0 *(6.5)*	2511	10.8	0.653 *(0.397)*	10.71 *(2.11)*	187 *(86)*	73 *(23)*	29.77 *(100.8)*
1st Gear									
71.2 *(53.1)*	5375 *(23.9)*	5.0 *(8.0)*	2500	7.5	0.639 *(0.389)*	10.91 *(2.15)*	187 *(86)*	75 *(24)*	29.77 *(100.8)*
2nd Gear									
70.5 *(52.6)*	5330 *(23.7)*	5.0 *(8.0)*	2500	7.4	0.656 *(0.399)*	10.66 *(2.10)*	185 *(85)*	77 *(25)*	29.77 *(100.8)*
2nd Gear									
71.7 *(53.5)*	3945 *(17.5)*	6.8 *(11.0)*	2500	4.5	0.644 *(0.392)*	10.86 *(2.14)*	185 *(85)*	75 *(24)*	29.77 *(100.8)*
2nd Gear									
71.9 *(53.6)*	3685 *(16.4)*	7.3 *(11.8)*	2496	1.2	0.643 *(0.391)*	10.86 *(2.14)*	185 *(85)*	75 *(24)*	29.77 *(100.8)*

TRACTOR SOUND LEVEL WITH CAB	dB(A)
Maximum sound level	85
Bystander	

DRAWBAR PERFORMANCE
MAXIMUM POWER AT SELECTED SPEEDS
(Ballasted Tractor)

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp °F (°C) cool ing med	Temp °F (°C) Air dry bulb	Barom inch Hg (kPa)
1st Gear									
41.7 *(31.1)*	10070 *(44.8)*	1.6 *(2.5)*	2633	14.9	1.131 *(0.688)*	6.19 *(1.22)*	189 *(87)*	82 *(28)*	29.97 *(101.5)*
1st Gear									
54.2 *(40.4)*	9350 *(41.6)*	2.2 *(3.5)*	2600	12.2	0.852 *(0.518)*	8.22 *(1.62)*	189 *(87)*	82 *(28)*	29.97 *(101.5)*
1st Gear									
67.5 *(50.3)*	8140 *(36.2)*	3.1 *(5.0)*	2501	9.4	0.674 *(0.410)*	10.41 *(2.05)*	187 *(86)*	82 *(28)*	29.97 *(101.5)*
1st Gear									
72.8 *(54.3)*	6765 *(30.1)*	4.0 *(6.5)*	2497	7.1	0.643 *(0.391)*	10.91 *(2.15)*	187 *(86)*	82 *(28)*	29.97 *(101.5)*
1st Gear									
73.4 *(54.7)*	5530 *(24.6)*	5.0 *(8.0)*	2501	4.7	0.628 *(0.382)*	11.17 *(2.20)*	187 *(86)*	79 *(26)*	29.94 *(101.4)*
1st Gear									
72.7 *(54.2)*	5350 *(23.8)*	5.1 *(8.2)*	2495	5.4	0.635 *(0.386)*	11.01 *(2.17)*	187 *(86)*	79 *(26)*	29.94 *(101.4)*
2nd Gear									
71.5 *(53.3)*	5395 *(24.0)*	5.0 *(8.0)*	2495	4.4	0.626 *(0.381)*	11.17 *(2.20)*	187 *(86)*	77 *(25)*	29.94 *(101.4)*
2nd Gear									
74.2 *(55.3)*	4070 *(18.1)*	6.8 *(11.0)*	2500	2.1	0.602 *(0.366)*	11.62 *(2.29)*	189 *(87)*	81 *(27)*	29.94 *(101.4)*
2nd Gear									
74.0 *(55.2)*	3800 *(16.9)*	7.3 *(11.8)*	2502	1.7	0.603 *(0.367)*	11.62 *(2.29)*	189 *(87)*	81 *(27)*	29.94 *(101.4)*

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data in accordance with official OECD test procedures. This tractor did not meet manufacturers 3 point lift capacity claim of 4400 lbs *(2000 kg)*. The performance figures on this summary were taken from a test conducted under the OECD restricted standard test code procedure.

We, the undersigned, certify that this is a true summary of data from OECD Report No. **1251,** Nebraska Summary 078, March 6, 1991.

LOUIS I. LEVITICUS
Engineer-in-Charge

K. VON BARGEN
R. D. GRISSO
G. J. HOFFMAN
Board of Tractor Test Engineers

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi (kPa)	Two 16.9-28; 8; 18 *(124)*	Two 16.9-28; 8; 18 *(124)*
Ballast	—Liquid (total)	1065 lb *(484 kg)*	None
	—Cast Iron (total)	None	None
Front Tires	—No., size, ply & psi (kPa)	Two 16.9-28; 8; 18 *(124)*	Two 16.9-28; 8; 18 *(124)*
Ballast	—Liquid (total)	1520 lb *(691 kg)*	None
	—Cast Iron (total)	1445 lb *(657 kg)*	None
Height of Drawbar		20.5 in *(520 mm)*	20.7 in *(525 mm)*
Static Weight	—Rear	5050 lb *(2286 kg)*	3965 lb *(1802 kg)*
	—Front	8401 lb *(3818 kg)*	5435 lb *(2470 kg)*
	—Total	13451 lb *(6104 kg)*	9400 lb *(4272 kg)*

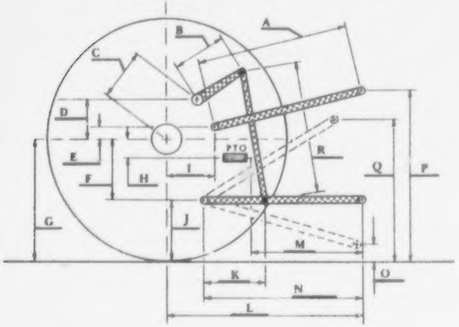
THREE POINT HITCH PERFORMANCE
(OECD Static Test)

CATEGORY: II

Quick Attach: None

Maximum Force Exerted Through Whole Range	4045 lbs *(18.0 kN)*
i) Opening pressure of relief valve	NA
Sustained pressure at compensation cutoff	3000 psi *(207 Bar)*
ii) Pump delivery rate at minimum pressure and rated engine speed	31.5 GPM *(119.2 l/min)*
iii) Pump delivery rate at maximum hydraulic power	29.5 GPM *(111.7 l/min)*
Delivery pressure	2700 psi *(186 Bar)*
Power	46.5 Hp *(34.7 kW)*

HITCH DIMENSIONS AS TESTED—NO LOAD



	inch	*mm*
A	24.2	*615*
B	12.4	*315*
C	20.4	*518*
D	19.7	*500*
E	15.7	*400*
F	0	*0*
G	25.0	*635*
H*	-4.7	*-119*
I	15.8	*401*
J	25.0	*635*
K	21.7	*550*
L	37.4	*950*
M	20.9	*531*
N	37.4	*950*
O	5.9	*150*
P	45.1	*1145*
Q	34.6	*878*
R	23.1	*588*

* PTO is above rear axle

Agricultural Research Division
Institute of Agriculture and Natural Resources
University of Nebraska-Lincoln
Darrell Nelson, Dean and Director

SUMMARY OF OECD TEST 1256—NEBRASKA SUMMARY 079
MASSEY FERGUSON 390T DIESEL
12 SPEED

POWER TAKE-OFF PERFORMANCE

Power HP *(kW)*	Crank shaft speed rpm	Gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Mean Atmospheric Conditions
MAXIMUM POWER AND FUEL CONSUMPTION					
Rated Engine Speed—(PTO speed—627 rpm)					
80.2 *(59.8)*	2197	4.91 *(18.59)*	0.429 *(0.261)*	16.29 *(3.21)*	
Standard Power Take-off Speed (540 rpm)					
75.1 *(56.0)*	1892	4.31 *(16.32)*	0.404 *(0.246)*	17.41 *(3.43)*	
VARYING POWER AND FUEL CONSUMPTION					
80.2 *(59.8)*	2197	4.91 *(18.59)*	0.429 *(0.261)*	16.29 *(3.21)*	Air temperature
68.7 *(51.2)*	2214	4.33 *(16.40)*	0.441 *(0.268)*	15.89 *(3.13)*	77°F *(25°C)*
51.8 *(38.6)*	2226	3.59 *(13.60)*	0.485 *(0.295)*	14.42 *(2.84)*	Relative humidity
34.7 *(25.9)*	2235	2.87 *(10.87)*	0.579 *(0.352)*	12.08 *(2.38)*	50%
17.4 *(13.0)*	2235	2.18 *(8.28)*	0.878 *(0.534)*	7.97 *(1.57)*	Barometer
—	2279	1.56 *(5.90)*	—	—	29.71" Hg *(100.6 kPa)*

Maximum Torque 233 lb.-ft. *(315.9 Nm)* at 1303 RPM
Maximum Torque Rise 21%

DRAWBAR PERFORMANCE
FUEL CONSUMPTION CHARACTERISTICS
(Front Wheel Drive Engaged)

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr *(kg/kW.h)*	Fuel Consumption Hp.hr/gal *(kW.h/l)*	Temp. °F (°C) cooling med	Temp. °F (°C) Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Power—9th (2HL) Gear									
65.2 *(48.6)*	3485 *(15.5)*	7.02 *(11.29)*	2202	5.1	0.538 *(0.327)*	12.89 *(2.54)*	189 *(87)*	63 *(17)*	29.80 *(100.9)*
75% of Pull at Maximum Power—9th (2HL) Gear									
49.6 *(37.0)*	2565 *(11.4)*	7.25 *(11.67)*	2225	3.3	0.580 *(0.353)*	12.08 *(2.38)*	178 *(81)*	63 *(17)*	29.80 *(100.9)*
50% of Pull at Maximum Power—9th (2HL) Gear									
34.1 *(25.4)*	1730 *(7.7)*	7.35 *(11.83)*	2227	2.1	0.679 *(0.413)*	10.30 *(2.03)*	176 *(80)*	64 *(18)*	29.80 *(100.9)*
75% of Pull at Reduced Engine Speed—10th (2HH) Gear									
40.8 *(30.4)*	2585 *(11.5)*	7.22 *(11.62)*	1758	3.4	0.498 *(0.303)*	14.01 *(2.76)*	178 *(81)*	63 *(17)*	29.80 *(100.9)*
50% of Pull at Reduced Engine Speed—10th (2HH) Gear									
33.9 *(25.3)*	1730 *(7.7)*	7.34 *(11.81)*	1762	2.1	0.559 *(0.340)*	12.49 *(2.46)*	176 *(80)*	63 *(17)*	29.80 *(100.9)*

Location of Test: AFRC Institute of Engineering Research, Wrest Park, Silsoe, Bedford, England MK45 4HS

Dates of Test: September to October 1989

Manufacturer: MASSEY FERGUSON MANUFACTURING Limited, Banner Lane, Coventry, Warwickshire, England CV4 9GF

FUEL and OIL: Fuel No. 2 Diesel **Cetane No.** 54.5 **Specific gravity converted to 60°/60°F *(15°/15°C)*** 0.8380 **Fuel weight** 6.977 lbs/gal *(0.836 kg/l)* **Oil SAE** 15W30 **Oil consumption for 10 hours** NA **Transmission lubricant** SAE 15W30 **Front axle lubricant** SAE 15W30

ENGINE: Make Perkins Diesel **Type** four cylinder vertical with turbocharger **Serial No.** A14 236 U330575 1 **Crankshaft** lengthwise **Rated engine speed** 2200 **Bore and stroke** 3.878" × 5.0" *(98.5 mm × 127.0 mm)* **Compression ratio** 15.5 to 1 **Displacement** 236 cu in *(3870 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements and centrifugal precleaner **Oil filter** one full flow cartridge **Fuel filter** one paper element and sediment bowl **Muffler** underhood **Exhaust** Vertical **Cooling medium temperature control** thermostat

CHASSIS: Type front wheel assist **Serial No.** 5724 P 23121 **Tread width** rear 59.1" *(1500 mm)* to 87.6" *(2225 mm)* front 58.7" *(1490 mm)* to 76.5" *(1944 mm)* **Wheel base** 92.5" *(2350 mm)* **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Nominal travel speeds mph *(km/h)*** first 1.22 *(1.96)* second 1.54 *(2.48)* third 1.82 *(2.93)* fourth 2.31 *(3.71)* fifth 3.34 *(5.38)* sixth 4.23 *(6.81)* seventh 4.97 *(8.00)* eighth 6.29 *(10.13)* ninth 7.46 *(12.00)* tenth 9.44 *(15.19)* eleventh 13.66 *(21.99)* twelfth 17.31 *(27.85)* reverse 1.82 *(2.93)*, 2.31 *(3.71)*, 7.46 *(12.00)*, 9.44 *(15.19)* **Clutch** single dry disc operated by foot pedal **Brakes** multiple wet disc hydraulically operated by two foot pedals which can be locked together **Steering** hydrostatic **Power take-off** 540 rpm at 1895 engine rpm and 1000 rpm at 1900 engine rpm **Unladen tractor mass** 7365 lb *(3340 kg)*

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with official OECD test procedures. This tractor did not meet the manufacturers claim of 4250 lbs *(1928 kg)* hitch lift capacity. The performance figures on this summary were taken from a test conducted under the OECD restricted standard test code procedure.

MAXIMUM POWER IN SELECTED GEARS
(Front Wheel Drive Engaged)

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp °F (°C) cooling med	Temp °F (°C) Air dry bulb	Barom. inch Hg (kPa)
5th (3LL) Gear									
52.4 *(39.1)*	6855 *(30.5)*	2.86 *(4.61)*	2234	15.0	0.607 *(0.369)*	11.52 *(2.27)*	178 *(81)*	64 *(18)*	29.80 *(100.9)*
6th (3LH) Gear									
60.3 *(45.0)*	6160 *(27.4)*	3.67 *(5.91)*	2202	12.5	0.580 *(0.353)*	12.00 *(2.36)*	180 *(82)*	64 *(18)*	29.80 *(100.9)*
7th (1HL) Gear									
63.2 *(47.1)*	5375 *(23.9)*	4.41 *(7.10)*	2192	9.8	0.551 *(0.335)*	12.58 *(2.48)*	180 *(82)*	63 *(17)*	29.80 *(100.9)*
8th (1HH) Gear									
64.1 *(47.8)*	4135 *(18.4)*	5.81 *(9.35)*	2199	6.5	0.547 *(0.333)*	12.79 *(2.52)*	180 *(82)*	63 *(17)*	29.80 *(100.9)*
9th (2HL) Gear									
65.2 *(48.6)*	3485 *(15.5)*	7.02 *(11.29)*	2202	5.1	0.538 *(0.327)*	12.99 *(2.56)*	180 *(82)*	63 *(17)*	29.80 *(100.9)*
10th (2HH) Gear									
63.3 *(47.2)*	2630 *(11.7)*	9.02 *(14.52)*	2200	3.5	0.551 *(0.335)*	12.69 *(2.50)*	180 *(82)*	63 *(17)*	29.80 *(100.9)*

TRACTOR SOUND LEVEL WITHOUT CAB	dB(A)
Maximum sound level	NA
Bystander in 12th (3HH) Gear	87

DRAWBAR PERFORMANCE
FUEL CONSUMPTION CHARACTERISTICS
(Front Wheel Drive Disengaged)

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp °F (°C) cooling med	Temp °F (°C) Air dry bulb	Barom. inch Hg (kPa)
Maximum Power—9th (2HL) Gear									
64.4 *(48.0)*	3640 *(16.2)*	6.62 *(10.66)*	2203	8.5	0.546 *(0.332)*	12.79 *(2.52)*	178 *(81)*	61 *(16)*	30.15 *(102.1)*
75% of Pull at Maximum Power—9th (2HL) Gear									
50.4 *(37.6)*	2745 *(12.2)*	6.89 *(11.09)*	2217	5.9	0.593 *(0.361)*	11.78 *(2.32)*	176 *(80)*	64 *(18)*	30.12 *(102.0)*
50% of Pull at Maximum Power—9th (2HL) Gear									
34.5 *(25.7)*	1820 *(8.1)*	7.08 *(11.40)*	2227	4.0	0.699 *(0.425)*	10.00 *(1.97)*	178 *(81)*	64 *(18)*	30.12 *(102.0)*
75% of Pull at Reduced Engine Speed—10th (2HH) Gear									
49.8 *(37.1)*	2700 *(12.0)*	6.90 *(11.10)*	1751	5.0	0.508 *(0.309)*	13.76 *(2.71)*	178 *(81)*	63 *(17)*	30.12 *(102.0)*
50% of Pull at Reduced Engine Speed—10th (2HH) Gear									
34.2 *(25.5)*	1800 *(8.0)*	7.12 *(11.46)*	1756	4.0	0.561 *(0.341)*	12.91 *(2.54)*	176 *(80)*	63 *(17)*	30.12 *(102.0)*

DRAWBAR PERFORMANCE
MAXIMUM POWER IN SELECTED GEARS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp °F (°C) cooling med	Temp °F (°C) Air dry bulb	Barom. inch Hg (kPa)
7th (1HL) Gear									
56.3 *(42.0)*	5035 *(22.4)*	4.19 *(6.74)*	2226	15.0	0.575 *(0.350)*	12.13 *(2.39)*	178 *(81)*	61 *(16)*	30.15 *(102.1)*
8th (1HH) Gear									
62.9 *(46.9)*	4340 *(19.3)*	5.43 *(8.74)*	2202	11.4	0.561 *(0.341)*	12.39 *(2.44)*	180 *(82)*	61 *(16)*	30.15 *(102.1)*
9th (2HL) Gear									
64.4 *(48.0)*	3640 *(16.2)*	6.62 *(10.66)*	2203	8.5	0.546 *(0.332)*	12.79 *(2.52)*	178 *(81)*	61 *(16)*	30.15 *(102.1)*
10th (2HH) Gear									
63.3 *(47.2)*	2745 *(12.2)*	8.64 *(13.91)*	2204	5.9	0.561 *(0.341)*	12.39 *(2.44)*	180 *(82)*	63 *(17)*	30.12 *(102.0)*

We, the undersigned, certify that this is a true summary of data from OECD Report No. **1265**, Nebraska Summary 079, March 6, 1991.

LOUIS I. LEVITICUS
Engineer in Charge

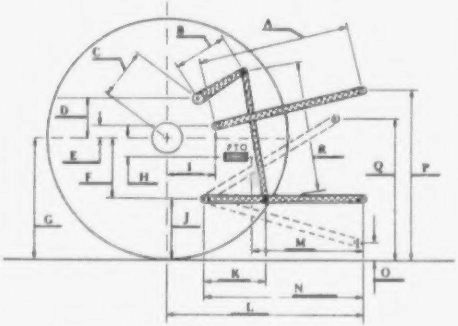
K. VON BARGEN
R. D. GRISSO
G. J. HOFFMAN
Board of Tractor Test Engineers

TIRES AND WEIGHT		**Tested Without Ballast**
Rear Tires	—No., size, ply & psi (kPa)	Two 16.9-30; 6; 12 *(83)*
Front Tires	—No., size, ply & psi (kPa)	Two 11.2-24; 8; 12 *(83)*
Height of Drawbar		12.4 in. *(315 mm) (4WD)* 16.5 in. *(419 mm) (2WD)*
Static Weight	—Rear	4430 lb *(2011 kg)*
	—Front	3090 lb *(1402 kg)*
	—Total	7520 lb *(3413 kg)*

THREE POINT HITCH PERFORMANCE
(OECD Static Test)

CATEGORY: II
Quick Attach: No

Maximum Force Exerted Through Whole Range	4180 lbs	*(18.6 kN)*
i) Opening pressure of relief valve	NA	
Sustained pressure of the open relief valve	3335 psi	*(230 Bar)*
ii) Pump delivery rate at minimum pressure	8.3 GPM	*(31.4 l/min)*
iii) Pump delivery rate at maximum hydraulic power	7.6 GPM	*(28.7 l/min)*
Delivery pressure	2900 psi	*(200 Bar)*
Power	12.9 Hp	*(9.6 kW)*



	inch	mm
A	29.6	*751*
B	10.5	*267*
C	12.0	*305*
D	9.2	*233*
E	8.1	*205*
F	8.4	*212*
G	27.4	*695*
H	5.2	*132*
I	7.3	*186*
J	19.0	*483*
K	19.8	*504*
L	36.7	*933*
M	25.0	*635*
N	38.0	*965*
O	7.9	*200*
P	39.1	*993*
Q	32.8	*833*
R	26.2	*666*

HITCH DIMENSIONS AS TESTED—NO LOAD

Agricultural Research Division
Institute of Agriculture and Natural Resources
University of Nebraska-Lincoln
Darrell Nelson, Dean and Director

SUMMARY OF OECD TEST 1287—NEBRASKA SUMMARY 077
CASE INTERNATIONAL 5140 DIESEL
24 SPEED

POWER TAKE-OFF PERFORMANCE

Power HP (kW)	Crank shaft speed rpm	Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Mean Atmospheric Conditions
MAXIMUM POWER AND FUEL CONSUMPTION					
Rated Engine Speed—(PTO speed—996 rpm)					
97.0 (72.3)	2200	5.80 (21.97)	0.416 (0.253)	16.70 (3.29)	
Maximum Power (2 hours)					
97.6 (72.8)	2150	5.77 (21.85)	0.411 (0.250)	16.90 (3.33)	
VARYING POWER AND FUEL CONSUMPTION					
97.0 (72.3)	2200	5.80 (21.97)	0.416 (0.253)	16.70 (3.29)	Air temperature
84.6 (63.1)	2259	5.30 (20.06)	0.436 (0.265)	15.94 (3.14)	68°F (20°C)
64.2 (47.9)	2285	4.45 (16.86)	0.482 (0.293)	14.42 (2.84)	Relative humidity
43.2 (32.2)	2307	3.60 (13.63)	0.579 (0.352)	12.01 (2.37)	60%
22.0 (16.4)	2341	2.79 (10.57)	0.886 (0.539)	7.87 (1.55)	Barometer
— —	2372	1.38 (5.22)	— —	— —	29.2" Hg (99.0 kPa)

Maximum Torque 306 lb.-ft. (415 Nm) at 1210 RPM
Maximum Torque Rise 32%

DRAWBAR PERFORMANCE
FUEL CONSUMPTION CHARACTERISTICS
(Front Wheel Drive Engaged)

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp °F (°C) cooling med	Temp °F (°C) Air dry bulb	Barom. inch Hg (kPa)
Maximum Power—19th (5N III) Gear									
81.0 (60.4)	4825 (21.46)	6.29 (10.13)	2196	5.3	0.503 (0.306)	13.76 (2.71)	174 (79)	39 (4)	29.2 (99.0)
75% of Pull at Maximum Power—19th (5N III) Gear									
64.0 (47.7)	3635 (16.17)	6.60 (10.62)	2265	3.8	0.552 (0.336)	12.54 (2.47)	174 (79)	39 (4)	29.2 (99.0)
50% of Pull at Maximum Power—19th (5N III) Gear									
43.7 (32.6)	2420 (10.77)	6.77 (10.89)	2291	2.5	0.651 (0.396)	10.66 (2.10)	174 (79)	39 (4)	29.2 (99.0)
75% of Pull at Reduced Engine Speed—20th (4N III) Gear									
63.8 (47.6)	3615 (16.08)	6.62 (10.65)	1854	3.9	0.511 (0.311)	13.55 (2.67)	174 (79)	39 (4)	29.2 (98.9)
50% of Pull at Reduced Engine Speed—20th (4N III) Gear									
43.6 (32.5)	2410 (10.72)	6.78 (10.91)	1854	2.6	0.582 (0.354)	11.95 (2.35)	174 (79)	39 (4)	29.2 (98.9)

Location of Test: DLG Testing Station for Agricultural Machinery, Max-Eyth-Weg 1, D-6114 Gross Umstadt, Germany

Dates of Test: October 1989 to January 1990

Manufacturer: J I Case, Gmbh, D-4040, Neuss, Germany

FUEL and OIL: Fuel No. 2 Diesel **Cetane No.** NA **Specific gravity converted to 60°/60°F** *(15°/15°C)* 0.835 **Fuel weight** 6.95 lbs/gal *(0.833 kg/l)* **Oil SAE** 10W30 **Oil consumption for 10 hours** NA **Transmission lubricant** Hy-Tran Plus Fluid **Front axle lubricant** SAE 85W140

ENGINE: Make Case Diesel **Type** six cylinder vertical with turbocharger **Serial No.** 52100030 **Crankshaft** lengthwise **Rated engine speed** 2200 **Bore and stroke** 4.016" × 4.724" *(102 mm × 120 mm)* **Compression ratio** 17.5 to 1 **Displacement** 359 cu in *(5883 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements **Oil filter** one full flow cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** one paper element **Muffler** underhood **Exhaust** vertical **Cooling medium temperature control** thermostat

CHASSIS: Type front wheel assist **Serial No.** JJF 1000057 **Tread width** rear *60.2" (1530 mm)* to *87.8" (2230 mm)* front *60.2" (1530 mm)* to *87.8" (2230 mm)* **Wheel base** 101.8" *(2585 mm)* **Transmission** selective gear fixed ratio with partial (4) range operator controlled powershift **Nominal travel speeds mph *(km/h)*** first 0.17 *(0.28)* second 0.21 *(0.34)* third 0.26 *(0.42)* fourth 0.32 *(0.52)* fifth 0.40 *(0.64)* sixth 0.48 *(0.78)* seventh 0.60 *(0.96)* eighth 0.74 *(1.19)* ninth 1.20 *(1.93)* tenth 1.45 *(2.34)* eleventh 1.80 *(2.89)* twelfth 2.22 *(3.58)* thirteenth 2.73 *(4.39)* fourteenth 3.31 *(5.32)* fifteenth 4.09 *(6.58)* sixteenth 4.49 *(7.22)* seventeenth 5.06 *(8.15)* eighteenth 5.44 *(8.75)* nineteenth 6.72 *(10.81)* twentieth 8.33 *(13.40)* twenty-first 9.81 *(15.79)* twenty-second 11.89 *(19.13)* twenty-third 14.69 *(23.63)* twenty-fourth 18.20 *(29.29)* reverse 0.21 *(0.34)*, 0.26 *(0.42)*, 0.32 *(0.52)*, 0.40 *(0.64)*, 0.49 *(0.79)*, 0.59 *(0.95)*, 0.73 *(1.18)*, 0.91 *(1.46)*, 1.46 *(2.35)*, 1.77 *(2.85)*, 2.19 *(3.52)*, 2.72 *(4.37)*, 3.33 *(5.36)*, 4.04 *(6.50)*, 4.99 *(8.03)*, 5.48 *(8.82)*, 6.18 *(9.95)*, 6.64 *(10.68)*, 8.20 *(13.20)*, 10.17 *(16.36)* **Clutch** wet multiple disc hydraulically operated by foot pedal **Brakes** wet disc hydraulically operated by two foot pedals which can be locked together **Steering** hydrostatic **Power take-off** 540 rpm at 2163 engine rpm and 1000 rpm at 2209 engine rpm **Unladen tractor mass** 11055 lb *(5015 kg)*

DRAWBAR PERFORMANCE
MAXIMUM POWER IN SELECTED GEARS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp °F (°C) cooling med	Temp °F (°C) Air dry bulb	Barom. inch Hg (kPa)
14th Gear (2N II)									
76.4 (57.0)	10135 (45.08)	2.83 (4.55)	2221	14.9	0.526 (0.320)	13.20 (2.60)	171 (77)	27 (-3)	29.4 (99.7)
15th Gear (3N II)									
79.8 (59.5)	8575 (38.14)	3.49 (5.62)	2148	11.5	0.506 (0.308)	13.65 (2.69)	174 (79)	27 (-3)	29.4 (99.7)
16th Gear (1N III)									
81.4 (60.7)	7770 (34.56)	3.93 (6.32)	2150	9.7	0.498 (0.303)	13.91 (2.74)	176 (80)	28 (-2)	29.4 (99.7)
17th Gear (4N II)									
81.1 (60.5)	6750 (30.03)	4.51 (7.25)	2150	8.3	0.498 (0.303)	13.91 (2.74)	176 (80)	28 (-2)	29.4 (99.7)
18th Gear (2N III)									
81.1 (60.5)	6225 (27.69)	4.88 (7.86)	2150	7.5	0.498 (0.303)	13.91 (2.74)	176 (80)	28 (-2)	29.4 (99.7)
19th Gear (3N III)									
81.4 (60.7)	4970 (22.11)	6.15 (9.89)	2150	5.6	0.498 (0.303)	13.96 (2.75)	174 (79)	28 (-2)	29.4 (99.7)
20th Gear (4N III)									
79.5 (59.3)	3850 (17.12)	7.74 (12.46)	2152	4.2	0.510 (0.310)	13.60 (2.68)	176 (80)	28 (-2)	29.4 (99.7)

TRACTOR SOUND LEVEL WITH CAB	Front Wheel Drive Disengaged dB(A)	Front Wheel Drive Engaged dB(A)
Maximum sound level	78.0	78.0
75% of Pull at Maximum Power	78.0	79.0
50% of Pull at Maximum Power	79.0	79.0
50% of Pull at Reduced Engine Speed	78.0	78.5
Bystander in 24th (4N IV) gear	86.0	—

DRAWBAR PERFORMANCE
MAXIMUM POWER IN SELECTED GEARS
(Front Wheel Drive Disengaged)

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp °F (°C) cooling med	Temp °F (°C) Air dry bulb	Barom. inch Hg (kPa)
16th Gear (1N III)									
73.9 (55.1)	7470 (33.23)	3.71 (5.97)	2216	15.0	0.549 (0.334)	12.64 (2.49)	172 (78)	36 (2)	29.4 (99.6)
17th Gear (4N II)									
76.0 (56.7)	6915 (30.75)	4.13 (6.64)	2148	13.7	0.531 (0.323)	13.05 (2.57)	176 (80)	36 (2)	29.4 (99.6)
18th Gear (2N III)									
77.4 (57.7)	6450 (28.69)	4.50 (7.24)	2150	12.7	0.523 (0.318)	13.25 (2.61)	178 (81)	36 (2)	29.4 (99.6)
19th Gear (3N III)									
77.4 (57.7)	5045 (22.44)	5.75 (9.26)	2150	9.4	0.523 (0.318)	13.25 (2.61)	176 (80)	36 (2)	29.4 (99.6)
20th Gear (4N III)									
76.7 (57.2)	3950 (17.57)	7.29 (11.73)	2150	7.3	0.528 (0.321)	13.15 (2.59)	178 (81)	36 (2)	29.4 (99.6)

TIRES AND WEIGHT		Tested Without Ballast
Rear Tires	—No., size, ply & psi (kPa)	Two 18.4-38; 8; 14 (100)
Front Tires	—No., size, ply & psi (kPa)	Two 13.6-28; 6; 12 (80)
Height of Drawbar		18.5 in (470 mm)
Static Weight	—Rear	6645 lb (3015 kg)
	—Front	4410 lb (2000 kg)
	—Total	11055 lb (5015 kg)

REPAIRS AND ADJUSTMENTS: No repairs or adjustments

REMARKS: All test results were determined from observed data in accordance with official OECD test procedures. This tractor did not meet manufacturers 3 point lift capacity claim of 7700 lbs *(3493 kg)* or hydraulic pump flow of 20.1 gpm *(76.1 l/m)*. The performance figures on this summary were taken from a test conducted under the OECD restricted standard test code procedure.

We, the undersigned, certify that this is a true summary of data from OECD Report No. **1287,** Nebraska Summary 077, March 6, 1991.

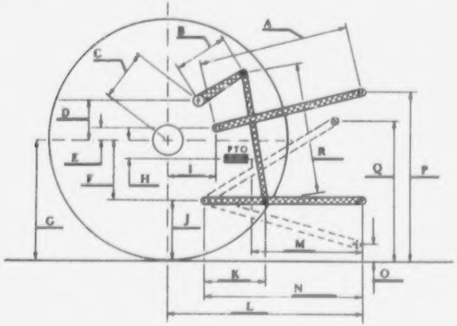
LOUIS I. LEVITICUS
Engineer-in-Charge

K. VON BARGEN
R. D. GRISSO
G. J. HOFFMAN
Board of Tractor Test Engineers

THREE POINT HITCH PERFORMANCE
(OECD Static Test)

CATEGORY: II	
Quick Attach: None	
Maximum Force Exerted Through Whole Range	6720 lbs *(29.9 kN)*
i) Opening pressure of relief valve	NA
Sustained pressure of the open relief valve	2740 psi *(189 Bar)*
ii) Pump delivery rate at minimum pressure	19.4 GPM *(73.3 l/min)*
iii) Pump delivery rate at maximum hydraulic power	17.0 GPM *(64.4 l/min)*
Delivery pressure	2250 psi *(155 Bar)*
Power	22.3 Hp *(16.6 kW)*

HITCH DIMENSIONS AS TESTED—NO LOAD



	inch	mm
A	29.7	*755*
B	9.1	*230*
C	11.9	*303*
D	7.1	*181*
E	6.3	*160*
F	9.7	*246*
G	31.3	*795*
H	3.8	*96*
I	14.1	*359*
J	21.6	*549*
K	21.9	*555*
L	43.6	*1108*
M	22.2	*563*
N	34.5	*877*
O	7.9	*200*
P	41.7	*1059*
Q	36.3	*923*
R	25.4	*645*

Agricultural Research Division
Institute of Agriculture and Natural Resources
University of Nebraska-Lincoln
Darrell Nelson, Dean and Director

SUMMARY OF OECD TEST 1286—NEBRASKA SUMMARY 076
CASE INTERNATIONAL 5130 DIESEL
16 SPEED

POWER TAKE-OFF PERFORMANCE

Power HP *(kW)*	Crank shaft speed rpm	Gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Mean Atmospheric Conditions
MAXIMUM POWER AND FUEL CONSUMPTION					
Rated Engine Speed—(PTO speed—996 rpm)					
89.9 *(67.0)*	2200	5.54 *(20.96)*	0.427 *(0.260)*	16.24 *(3.20)*	
VARYING POWER AND FUEL CONSUMPTION					
89.8 *(67.0)*	2200	5.54 *(20.96)*	0.427 *(0.260)*	16.24 *(3.20)*	Air temperature
78.6 *(58.6)*	2264	5.05 *(19.12)*	0.447 *(0.272)*	15.58 *(3.07)*	66°F *(19°C)*
59.8 *(44.6)*	2296	4.12 *(15.61)*	0.480 *(0.292)*	14.52 *(2.86)*	Relative humidity
40.2 *(30.0)*	2320	3.31 *(12.53)*	0.572 *(0.348)*	12.18 *(2.40)*	30%
20.4 *(15.2)*	2348	2.53 *(9.58)*	0.863 *(0.525)*	8.07 *(1.59)*	Barometer
— —	2383	1.78 *(6.73)*	— —	— —	29.2" Hg *(99.0 kPa)*

Maximum Torque 261 lb.-ft. *(354 Nm)* at 1299 RPM
Maximum Torque Rise 21.6%

DRAWBAR PERFORMANCE
FUEL CONSUMPTION CHARACTERISTICS
(Front Wheel Drive Engaged)

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr *(kg/kW.h)*	Fuel Consumption Hp.hr/gal *(kW.h/l)*	Temp °F *(°C)* cooling med	Temp °F *(°C)* Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Power—10th (2 III) Gear									
74.3 *(55.4)*	5925 *(26.35)*	4.70 *(7.57)*	2205	7.0	0.519 *(0.316)*	13.25 *(2.61)*	178 *(81)*	46 *(8)*	29.3 *(99.2)*
75% of Pull at Maximum Power—10th (2 III) Gear									
58.7 *(43.8)*	4430 *(19.71)*	4.97 *(8.00)*	2276	4.9	0.552 *(0.336)*	12.49 *(2.46)*	178 *(81)*	46 *(8)*	29.3 *(99.2)*
50% of Pull at Maximum Power—10th (2 III) Gear									
40.6 *(30.3)*	2955 *(13.15)*	5.15 *(8.29)*	2307	2.7	0.633 *(0.385)*	10.91 *(2.15)*	178 *(81)*	46 *(8)*	29.3 *(99.2)*
75% of Pull at Reduced Engine Speed—11th (3 III) Gear									
58.9 *(43.9)*	4445 *(19.78)*	4.96 *(7.99)*	1843	4.8	0.505 *(0.307)*	13.65 *(2.69)*	178 *(81)*	50 *(10)*	29.2 *(98.8)*
50% of Pull at Reduced Engine Speed—11th (3 III) Gear									
40.6 *(30.3)*	2970 *(13.21)*	5.14 *(8.27)*	1867	2.8	0.554 *(0.337)*	12.49 *(2.46)*	178 *(81)*	50 *(10)*	29.2 *(98.8)*

Location of Test: DLG Testing Station for Agricultural Machinery, Max-Eyth-Weg 1, D-6114 Gross Umstadt, Germany

Dates of Test: December 1989 to February 1990

Manufacturer: J I Case, Gmbh, D-4040, Neuss, Germany

FUEL and OIL: Fuel No. 2 Diesel **Cetane No.** NA **Specific gravity converted to 60°/60°F** *(15°/15°C)* 0.835 **Fuel weight** 6.95 lbs/gal *(0.833 kg/l)* **Oil SAE** 10W30 **Oil consumption for 10 hours** NA **Transmission lubricant** HyTran Plus Fluid **Front axle lubricant** SAE 85W140

ENGINE: Make Case Diesel **Type** six cylinder vertical **Serial No.** 52100627 **Crankshaft** lengthwise **Rated engine speed** 2200 **Bore and stroke** 4.016" × 4.724" *(102 mm × 120 mm)* **Compression ratio** 17.0 to 1 **Displacement** 359 cu in *(5883 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements **Oil filter** one full flow cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** one paper element **Muffler** underhood **Exhaust** vertical **Cooling medium temperature control** thermostat

CHASSIS: Type front wheel assist **Serial No.** JJF 1000055 **Tread width** rear 60.2" *(1530 mm)* to 87.8" *(2230 mm)* front 60.2" *(1530 mm)* to 87.8" *(2230 mm)* **Wheel base** 101.8" *(2585 mm)* **Transmission** selective gear fixed ratio with partial (4) range operator controlled powershift **Nominal travel speeds mph *(km/h)*** first 1.09 *(1.75)* second 1.32 *(2.12)* third 1.62 *(2.61)* fourth 2.01 *(3.24)* fifth 2.47 *(3.98)* sixth 3.00 *(4.82)* seventh 3.70 *(5.96)* eighth 4.06 *(6.54)* ninth 4.59 *(7.38)* tenth 4.93 *(7.93)* eleventh 6.08 *(9.79)* twelfth 7.54 *(12.14)* thirteenth 8.89 *(14.30)* fourteenth 10.77 *(17.33)* fifteenth 13.30 *(21.40)* sixteenth 16.49 *(26.53)* reverse 1.32 *(2.13)*, 1.60 *(2.58)*, 1.98 *(3.19)*, 2.45 *(3.95)*, 3.02 *(4.86)*, 3.66 *(5.89)*, 4.52 *(7.27)*, 4.96 *(7.98)*, 5.60 *(9.01)*, 6.02 *(9.68)*, 7.43 *(11.95)*, 9.20 *(14.81)* **Clutch** wet multiple disc hydraulically operated by foot pedal **Brakes** wet disc hydraulically operated by two foot pedals which can be locked together **Steering** hydrostatic **Power take-off** 540 rpm at 2163 engine rpm and 1000 rpm at 2200 engine rpm **Unladen tractor mass** 10670 lb *(4840 kg)*.

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

DRAWBAR PERFORMANCE
MAXIMUM POWER IN SELECTED GEARS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp °F (°C) cool ing med	Temp °F (°C) Air dry bulb	Barom inch Hg (kPa)
6th Gear (2 II)									
69.6 (51.9)	9790 (43.55)	2.67 (4.29)	2238	15.1	0.551 (0.335)	12.49 (2.46)	176 (80)	48 (9)	29.2 (99.0)
7th Gear (3 II)									
72.1 (53.8)	7965 (35.44)	3.40 (5.47)	2203	10.8	0.534 (0.325)	12.89 (2.54)	180 (82)	46 (8)	29.2 (99.0)
8th Gear (1 III)									
73.0 (54.4)	7240 (32.21)	3.78 (6.08)	2198	9.5	0.529 (0.322)	13.05 (2.57)	178 (81)	45 (7)	29.3 (99.2)
9th Gear (4 II)									
73.5 (54.8)	6350 (28.24)	4.34 (6.99)	2201	7.9	0.524 (0.319)	13.15 (2.59)	180 (82)	46 (8)	29.2 (99.0)
10th Gear (2 III)									
74.3 (55.4)	5925 (26.35)	4.70 (7.57)	2203	7.0	0.519 (0.316)	13.25 (2.61)	178 (81)	46 (8)	29.3 (99.2)
11th Gear (3 III)									
73.9 (55.1)	4680 (20.82)	5.92 (9.52)	2201	5.0	0.523 (0.318)	13.20 (2.60)	180 (82)	46 (8)	29.3 (99.2)
12th Gear (4 III)									
72.0 (53.7)	3625 (16.13)	7.44 (11.98)	2201	3.6	0.536 (0.326)	12.84 (2.53)	178 (81)	46 (8)	29.3 (99.2)

TRACTOR SOUND LEVEL WITH CAB	Front Wheel Drive Disengaged dB(A)	Front Wheel Drive Engaged dB(A)
Maximum sound level	78.5	78.0
75% of Pull at Maximum Power	77.5	77.5
50% of Pull at Maximum Power	77.5	77.5
50% of Pull at Reduced Engine Speed	77.0	76.0
Bystander in 16th (4 IV) gear	87.5	—

DRAWBAR PERFORMANCE
MAXIMUM POWER IN SELECTED GEARS
(Front Wheel Drive Disengaged)

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp °F (°C) cool ing med	Temp °F (°C) Air dry bulb	Barom inch Hg (kPa)
8th Gear (1 III)									
67.2 (50.1)	7120 (31.68)	3.54 (5.69)	2240	15.1	0.570 (0.347)	12.08 (2.38)	176 (80)	52 (11)	29.3 (99.3)
9th Gear (4 II)									
69.3 (51.7)	6450 (28.68)	4.03 (6.49)	2198	12.6	0.556 (0.338)	12.39 (2.44)	178 (81)	52 (11)	29.3 (99.3)
10th Gear (2 III)									
70.4 (52.5)	6025 (26.80)	4.38 (7.05)	2198	11.5	0.549 (0.334)	12.59 (2.48)	180 (82)	52 (11)	29.3 (99.3)
11th Gear (3 III)									
70.9 (52.9)	4765 (21.19)	5.58 (8.98)	2198	8.6	0.544 (0.331)	12.69 (2.50)	178 (81)	52 (11)	29.3 (99.3)
12th Gear (4 III)									
69.9 (52.1)	3700 (16.45)	7.08 (11.40)	2198	6.6	0.552 (0.336)	12.49 (2.46)	180 (82)	52 (11)	29.4 (99.4)

TIRES AND WEIGHT		Tested Without Ballast
Rear Tires	—No., size, ply & psi (kPa)	Two 18.4-30; 6; 14 (100)
Front Tires	—No., size, ply & psi (kPa)	Two 12.4-24; 6; 19 (130)
Height of Drawbar		15.7 in (400 mm)
Static Weight	—Rear	6415 lb (2910 kg)
	—Front	4255 lb (1930 kg)
	—Total	10670 lb (4840 kg)

REMARKS: All test results were determined from observed data in accordance with official OECD test procedures. This tractor did not meet manufacturers 3 point lift capacity claim of 7700 lbs (*3493 kg*) or hydraulic pump flow of 20.1 gpm (*76.1 l/m*). The performance figures on this summary were taken from a test conducted under the OECD restricted standard test code procedure.

We, the undersigned, certify that this is a true summary of data from OECD Report No. **1286**, Nebraska Summary 076, March 6, 1991.

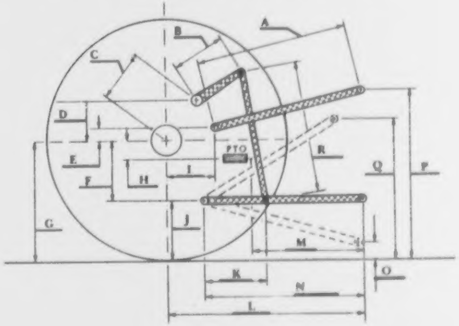
LOUIS I. LEVITICUS
Engineer-in-Charge

K. VON BARGEN
R. D. GRISSO
G. J. HOFFMAN
Board of Tractor Test Engineers

THREE POINT HITCH PERFORMANCE
(OECD Static Test)

CATEGORY: II	
Quick Attach: None	
Maximum Force Exerted Through Whole Range	6135 lbs (*27.3 kN*)
i) Opening pressure of relief valve	NA
Sustained pressure of the open relief valve	2725 psi (*188 Bar*)
ii) Pump delivery rate at minimum pressure	19.1 GPM (*72.4 l/min*)
iii) Pump delivery rate at maximum hydraulic power	17.2 GPM (*65.1 l/min*)
Delivery pressure	2220 psi (*153 Bar*)
Power	22.3 Hp (*16.6 kW*)

HITCH DIMENSIONS AS TESTED—NO LOAD



	inch	mm
A	29.8	*758*
B	9.1	*230*
C	11.9	*303*
D	7.1	*181*
E	6.3	*160*
F	9.7	*246*
G	28.4	*720*
H	3.8	*96*
I	14.1	*359*
J	18.7	*474*
K	21.9	*555*
L	43.6	*1108*
M	22.2	*563*
N	34.5	*877*
O	7.9	*200*
P	38.7	*984*
Q	34.6	*880*
R	22.7	*577*

Agricultural Research Division
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Darrell Nelson, Dean and Director

SUMMARY OF OECD TEST 1257—NEBRASKA SUMMARY 075
CASE INTERNATIONAL 5120 DIESEL
24 SPEED

POWER TAKE-OFF PERFORMANCE

Power HP (kW)	Crank shaft speed rpm	Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Mean Atmospheric Conditions
MAXIMUM POWER AND FUEL CONSUMPTION					
Rated Engine Speed—(PTO speed—996 rpm)					
78.2 (58.3)	2200	4.76 (18.00)	0.422 (0.257)	16.45 (3.24)	
Maximum Power (2 hours)					
79.4 (59.2)	2150	4.74 (17.94)	0.416 (0.253)	16.75 (3.30)	
VARYING POWER AND FUEL CONSUMPTION					
78.2 (58.3)	2200	4.76 (18.00)	0.422 (0.257)	16.45 (3.24)	Air temperature
68.0 (50.7)	2249	4.29 (16.25)	0.439 (0.267)	15.84 (3.12)	70°F (21°C)
52.5 (39.0)	2305	3.63 (13.73)	0.483 (0.294)	14.42 (2.84)	Relative humidity
35.5 (26.3)	2332	2.93 (11.08)	0.577 (0.351)	12.03 (2.37)	54%
17.8 (13.3)	2363	2.23 (8.45)	0.870 (0.529)	7.97 (1.57)	Barometer
— —	2387	1.57 (5.93)	— —	— —	29.5" Hg (100.0 kPa)

Maximum Torque 243 lb.-ft. (330 Nm) at 1501 RPM
Maximum Torque Rise 30.4%

DRAWBAR PERFORMANCE
FUEL CONSUMPTION CHARACTERISTICS
(Front Wheel Drive Engaged)

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp °F (°C) cool-ing med	Temp °F (°C) Air dry bulb	Barom. inch Hg (kPa)
Maximum Power—17th (4N II) Gear									
64.4 (48.0)	5230 (23.27)	4.62 (7.43)	2201	6.7	0.515 (0.313)	13.50 (2.66)	180 (82)	45 (7)	29.4 (99.6)
75% of Pull at Maximum Power—17th (4N II) Gear									
50.8 (37.9)	3920 (17.43)	4.86 (7.82)	2267	4.7	0.559 (0.340)	12.44 (2.45)	180 (82)	45 (7)	29.4 (99.6)
50% of Pull at Maximum Power—17th (4N II) Gear									
35.4 (26.4)	2625 (11.68)	5.05 (8.13)	2316	3.0	0.641 (0.390)	10.86 (2.14)	180 (82)	45 (7)	29.4 (99.6)
75% of Pull at Reduced Engine Speed—18th (2N III) Gear									
51.0 (38.0)	3895 (17.33)	4.90 (7.89)	2134	4.7	0.534 (0.325)	13.05 (2.57)	178 (81)	46 (8)	29.4 (99.6)
50% of Pull at Reduced Engine Speed—18th (2N III) Gear									
35.4 (26.4)	2610 (11.61)	5.10 (8.20)	2181	3.0	0.616 (0.375)	11.27 (2.22)	178 (81)	46 (8)	29.4 (99.6)

Location of Test: DLG Testing Station for Agricultural Machinery, Max-Eyth-Weg 1, D-6114 Gross Umstadt, Germany

Dates of Test: October to November 1989

Manufacturer: J I Case, Gmbh, D-4040, Neuss, Germany

FUEL and OIL: Fuel No. 2 Diesel **Cetane No.** NA **Specific gravity converted to 60°/60°F** *(15°/15°C)* 0.855 **Fuel weight** 6.95 lbs/gal *(0.833 kg/l)* **Oil SAE** 10W30 **Oil consumption for 10 hours** NA **Transmission lubricant** Hy-Tran Plus Fluid **Front axle lubricant** SAE 85W140

ENGINE: Make Case Diesel **Type** four cylinder vertical with turbocharger and intercooler **Serial No.** 52100605 **Crankshaft** lengthwise **Rated engine speed** 2200 **Bore and stroke** 4.016" × 4.724" *(102 mm × 120 mm)* **Compression ratio** 16.5 to 1 **Displacement** 239 cu in *(3922 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements **Oil filter** one full flow cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** one paper element **Muffler** underhood **Exhaust** vertical **Cooling medium temperature control** thermostat

CHASSIS: Type front wheel assist **Serial No.** JJF 1000056 **Tread width** rear 60.2" *(1530 mm)* to 87.8" *(2230 mm)* front 60.2" *(1530 mm)* to 87.8" *(2230 mm)* **Wheel base** 92.5" *(2345 mm)* **Transmission** selective gear fixed ratio with partial (3) range operator controlled powershift **Nominal travel speeds mph (km/h)** first 0.17 *(0.28)* second 0.21 *(0.34)* third 0.25 *(0.41)* fourth 0.32 *(0.51)* fifth 0.39 *(0.63)* sixth 0.47 *(0.76)* seventh 0.58 *(0.93)* eighth 0.73 *(1.17)* ninth 1.17 *(1.89)* tenth 1.42 *(2.29)* eleventh 1.76 *(2.83)* twelfth 2.18 *(3.51)* thirteenth 2.68 *(4.31)* fourteenth 3.24 *(5.22)* fifteenth 4.01 *(6.45)* sixteenth 4.40 *(7.08)* seventeenth 4.96 *(7.99)* eighteenth 5.33 *(8.58)* nineteenth 6.59 *(10.60)* twentieth 8.17 *(13.14)* twenty-first 9.61 *(15.47)* twenty-second 11.65 *(18.75)* twenty-third 14.40 *(23.17)* twenty-fourth 17.84 *(28.71)* reverse 0.21 *(0.34)*, 0.25 *(0.41)*, 0.32 *(0.51)*, 0.39 *(0.63)*, 0.48 *(0.77)*, 0.58 *(0.93)*, 0.71 *(1.15)*, 0.89 *(1.43)*, 1.44 *(2.31)*, 1.74 *(2.80)*, 2.14 *(3.45)*, 2.66, *(4.28)*, 3.27 *(5.26)*, 3.96 *(6.37)*, 4.89 *(7.87)*, 5.37 *(8.64)*, 6.06 *(9.75)*, 6.51 *(10.47)*, 8.04 *(12.94)*, 9.97 *(16.04)* **Clutch** wet multiple disc hydraulically operated by foot pedal **Brakes** wet disc hydraulically operated by two foot pedals which can be locked together **Steering** hydrostatic **Power take-off** 540 rpm at 2163 engine rpm and 1000 rpm at 2209 engine rpm **Unladen tractor mass** 10540 lb *(4780 kg)*

MAXIMUM POWER IN SELECTED GEARS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp °F (°C) cool-ing med	Temp °F (°C) Air dry bulb	Barom. inch Hg (kPa)
13th Gear (1N II)									
55.8 (41.6)	9055 (40.27)	2.31 (3.72)	2240	15.0	0.562 (0.342)	12.39 (2.44)	180 (82)	41 (5)	29.3 (99.1)
14th Gear (2N II)									
62.6 (46.7)	8565 (38.09)	2.74 (4.41)	2152	13.2	0.528 (0.321)	13.20 (2.60)	181 (83)	43 (6)	29.3 (99.1)
15th Gear (3N II)									
64.8 (48.3)	6915 (30.75)	3.52 (5.66)	2148	9.6	0.513 (0.312)	13.55 (2.67)	181 (83)	46 (7)	29.3 (99.1)
16th Gear (1N III)									
65.3 (48.7)	6245 (27.78)	3.92 (6.31)	2152	8.3	0.508 (0.309)	13.71 (2.70)	180 (82)	46 (8)	29.4 (99.5)
17th Gear (4N II)									
65.2 (48.6)	5445 (24.22)	4.49 (7.22)	2150	7.2	0.510 (0.310)	13.65 (2.69)	181 (83)	46 (8)	29.3 (99.1)
18th Gear (2N III)									
64.9 (48.4)	5020 (22.33)	4.85 (7.80)	2150	6.4	0.511 (0.311)	13.60 (2.68)	181 (83)	46 (8)	29.3 (99.3)
19th Gear (3N III)									
65.2 (48.6)	4000 (17.80)	6.10 (9.82)	2154	4.6	0.510 (0.310)	13.60 (2.68)	180 (82)	46 (8)	29.4 (99.5)
20th Gear (4N III)									
63.2 (47.1)	3105 (13.81)	7.63 (12.28)	2148	5.6	0.526 (0.320)	13.25 (2.61)	180 (82)	46 (8)	29.4 (99.5)

TRACTOR SOUND LEVEL WITH CAB	Front Wheel Drive Disengaged dB(A)	Front Wheel Drive Engaged dB(A)
Maximum sound level	78.5	78.5
75% of Pull at Maximum Power	77.5	78.0
50% of Pull at Maximum Power	77.5	78.0
50% of Pull at Reduced Engine Speed	77.0	77.0
Bystander in 24th (4N IV) gear	84.0	—

DRAWBAR PERFORMANCE
MAXIMUM POWER IN SELECTED GEARS
(Front Wheel Drive Disengaged)

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp °F (°C) cool-ing med	Temp °F (°C) Air dry bulb	Barom. inch Hg (kPa)
13th Gear (2N II)									
49.3 (36.8)	6740 (29.99)	2.75 (4.42)	2254	15.0	0.597 (0.363)	11.62 (2.29)	181 (83)	48 (9)	29.3 (99.1)
15th Gear (3N II)									
59.3 (44.2)	6720 (29.89)	3.31 (5.32)	2196	15.0	0.561 (0.341)	12.39 (2.44)	180 (82)	48 (9)	29.3 (99.1)
16th Gear (1N III)									
59.7 (44.5)	6165 (27.42)	3.63 (5.84)	2148	13.4	0.556 (0.338)	12.49 (2.46)	181 (83)	50 (10)	29.3 (99.1)
17th Gear (4N II)									
60.5 (45.1)	5440 (24.19)	4.17 (6.71)	2150	11.8	0.547 (0.333)	12.69 (2.50)	181 (83)	48 (9)	29.3 (99.1)
18th Gear (2N III)									
62.4 (46.5)	5195 (23.10)	4.51 (7.25)	2152	11.1	0.533 (0.324)	13.05 (2.57)	180 (82)	48 (9)	29.3 (99.1)
19th Gear (3N III)									
61.7 (46.0)	4030 (17.92)	5.74 (9.24)	2154	8.2	0.538 (0.327)	12.94 (2.55)	180 (82)	48 (9)	29.3 (99.1)
20th Gear (4N III)									
60.5 (45.1)	3120 (13.88)	7.27 (11.70)	2152	6.2	0.547 (0.333)	12.69 (2.50)	181 (83)	48 (9)	29.3 (99.1)

TIRES AND WEIGHT		Tested Without Ballast
Rear Tires	—No., size, ply & psi (kPa)	Two 15.5-38; 6; 16 (110)
Front Tires	—No., size, ply & psi (kPa)	Two 12.4-24; 6; 19 (130)
Height of Drawbar		16.5 in (415 mm)
Static Weight	—Rear	6340 lb (2875 kg)
	—Front	4200 lb (1905 kg)
	—Total	10540 lb (4780 kg)

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data in accordance with official OECD test procedures. This tractor did not meet manufacturers 3 point lift capacity claim of 7700 lbs *(3493 kg)* or hydraulic pump flow of 20.1 gpm *(76.1 l/m)*. The performance figures on this summary were taken from a test conducted under the OECD restricted standard test code procedure.

We, the undersigned, certify that this is a true summary of data from OECD Report No. **1257,** Nebraska Summary 075, March 6, 1991.

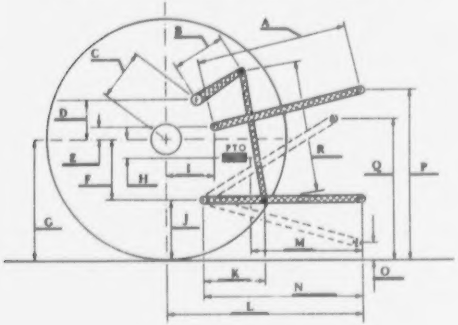
LOUIS I. LEVITICUS
Engineer-in-Charge

K. VON BARGEN
R. D. GRISSO
G. J. HOFFMAN
Board of Tractor Test Engineers

THREE POINT HITCH PERFORMANCE
(OECD Static Test)

CATEGORY II	
Quick Attach None	
Maximum Force Exerted Through Whole Range	6250 lbs *(27.8 kN)*
i) Opening pressure of relief valve	NA
Sustained pressure of the open relief valve	2715 psi *(187 Bar)*
ii) Pump delivery rate at minimum pressure	18.8 GPM *(71.0 l/min)*
iii) Pump delivery rate at maximum hydraulic power	16.7 GPM *(63.4 l/min)*
Delivery pressure	2220 psi *(153 Bar)*
Power	21.7 Hp *(16.2 kW)*

HITCH DIMENSIONS AS TESTED—NO LOAD



	inch	mm
A	29.7	*755*
B	9.1	*230*
C	11.9	*303*
D	7.1	*181*
E	6.3	*160*
F	9.7	*246*
G	29.3	*745*
H	3.8	*96*
I	14.1	*359*
J	19.6	*499*
K	21.9	*555*
L	43.6	*1108*
M	22.2	*563*
N	34.5	*877*
O	7.9	*200*
P	39.7	*1009*
Q	34.8	*885*
R	23.4	*594*

Agricultural Research Division
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Darrell Nelson, Dean and Director

SUMMARY OF OECD TEST 1258—NEBRASKA SUMMARY 073
MASSEY FERGUSON 362 DIESEL
8 SPEED

POWER TAKE-OFF PERFORMANCE

Power HP *(kW)*	Crank shaft speed rpm	Gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Mean Atmospheric Conditions
MAXIMUM POWER AND FUEL CONSUMPTION					
Rated Engine Speed—(PTO speed—663 rpm)					
55.1 *(41.1)*	2196	3.46 *(13.10)*	0.439 *(0.267)*	15.94 *(3.14)*	
Standard Power Take-off Speed (539 rpm)					
51.8 *(38.6)*	1784	2.97 *(11.26)*	0.405 *(0.245)*	17.41 *(3.43)*	
VARYING POWER AND FUEL CONSUMPTION					
55.1 *(41.1)*	2196	3.46 *(13.10)*	0.439 *(0.267)*	15.94 *(3.14)*	Air temperature
47.6 *(35.5)*	2233	3.09 *(11.70)*	0.454 *(0.276)*	15.38 *(3.03)*	64°F *(18°C)*
35.7 *(26.6)*	2241	2.57 *(9.74)*	0.503 *(0.306)*	13.86 *(2.73)*	Relative humidity
24.1 *(18.0)*	2245	2.08 *(7.86)*	0.602 *(0.366)*	11.62 *(2.29)*	64%
12.1 *(9.0)*	2255	1.63 *(6.16)*	0.944 *(0.574)*	7.41 *(1.46)*	Barometer
— —	2282	1.21 *(4.57)*	— —	— —	30.45" Hg *(103.1 kPa)*

Maximum Torque 172.7 lb-ft *(234.1 Nm)* at 1175 RPM
Maximum Torque Rise 30.8%

DRAWBAR PERFORMANCE
FUEL CONSUMPTION CHARACTERISTICS
(Front Wheel Drive Engaged)

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr *(kg/kW.h)*	Fuel Consumption Hp.hr/gal *(kW.h/l)*	Temp °F *(°C)* cooling med	Temp °F *(°C)* Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Power—5th (1H) Gear									
44.1 *(32.9)*	3215 *(14.3)*	5.14 *(8.27)*	2204	6.6	0.579 *(0.352)*	12.08 *(2.38)*	165 *(74)*	46 *(8)*	30.06 *(101.8)*
75% of Pull at Maximum Power—5th (1H) Gear									
34.3 *(25.6)*	2430 *(10.8)*	5.32 *(8.56)*	2233	4.5	0.623 *(0.379)*	11.22 *(2.21)*	158 *(70)*	45 *(7)*	30.06 *(101.8)*
50% of Pull at Maximum Power—5th (1H) Gear									
23.3 *(17.4)*	1620 *(7.2)*	5.43 *(8.74)*	2244	2.4	0.730 *(0.444)*	9.59 *(1.89)*	160 *(71)*	45 *(7)*	30.06 *(101.8)*
75% of Pull at Reduced Engine Speed—6th (2H) Gear									
34.1 *(25.4)*	2405 *(10.7)*	5.31 *(8.55)*	1525	4.5	0.533 *(0.324)*	13.15 *(2.59)*	158 *(70)*	45 *(7)*	30.06 *(101.8)*
50% of Pull at Reduced Engine Speed—6th (2H) Gear									
23.5 *(17.5)*	1620 *(7.2)*	5.43 *(8.74)*	1532	2.4	0.587 *(0.357)*	11.95 *(2.35)*	156 *(69)*	43 *(6)*	30.06 *(101.8)*

Location of Test: AFRC Institute of Engineering Research, Wrest Park, Silsoe, Bedford, England MK45 4HS

Dates of Test: December 1989 to March 1990

Manufacturer: MASSEY FERGUSON MANUFACTURING Limited, Banner Lane, Coventry, Warwickshire, England CV4 9GF

FUEL and OIL: Fuel No. 2 Diesel **Cetane No.** 54.5 **Specific gravity converted to 60°/60°F** *(15°/15°C)* 0.8380 **Fuel weight** 6.977 lbs/gal *(0.836 kg/l)* **Oil SAE** 15W30 **Oil consumption for 10 hours** NA **Transmission and hydraulic lubricant** SAE 15W30 **Front axle lubricant** SAE 15W30

ENGINE: Make Perkins Diesel **Type** four cylinder vertical **Serial No.** A4.236 LD31190 U3016231 **Crankshaft** lengthwise **Rated engine speed** 2200 **Bore and stroke** 3.878" × 5.0" *(98.5 mm × 127.0 mm)* **Compression ratio** 16 to 1 **Displacement** 236 cu in *(3870 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements and centrifugal precleaner **Oil filter** one full flow cartridge **Fuel filter** one paper element and sediment bowl **Muffler** vertical **Cooling medium temperature control** thermostat

CHASSIS: Type front wheel assist **Serial No.** 5727 N 36194 **Tread width** rear 55.0" *(1398 mm)* to 75.1" *(1908 mm)* front 59.1" *(1502 mm)* **Wheel base** 87.0" *(2209 mm)* **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Nominal travel speeds mph *(km/h)*** first 1.40 *(2.25)* second 2.05 *(3.30)* third 3.76 *(6.05)* fourth 4.61 *(7.42)* fifth 5.59 *(9.00)* sixth 8.20 *(13.20)* seventh 15.03 *(24.19)* eighth 18.45 *(29.69)* reverse 1.90 *(3.06)*, 7.61 *(12.25)* **Clutch** single dry disc operated by foot pedal **Brakes** multiple wet disc hydraulically power operated by two foot pedals which can be locked together **Steering** hydrostatic **Power take-off** 540 rpm at 1789 engine rpm **Unladen tractor mass** 6175 lb *(2802 kg)*

MAXIMUM POWER IN SELECTED GEARS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp °F (°C) cooling med	Temp °F (°C) Air dry bulb	Barom inch Hg (kPa)
				2nd Gear (2L)					
25.7 (19.2)	5555 (24.7)	1.74 (2.80)	2238	15.0	0.715 (0.435)	9.80 (1.93)	160 (71)	46 (8)	30.06 (101.8)
				3rd Gear (3L)					
42.2 (31.5)	4900 (21.8)	3.23 (5.20)	2200	12.1	0.600 (0.365)	11.62 (2.29)	165 (74)	45 (7)	30.06 (101.8)
				4th Gear (4L)					
42.5 (31.7)	3845 (17.1)	4.15 (6.68)	2205	8.6	0.598 (0.364)	11.67 (2.30)	165 (74)	45 (7)	30.06 (101.8)
				5th Gear (1H)					
44.1 (32.9)	3215 (14.3)	5.14 (8.27)	2204	6.6	0.579 (0.352)	12.08 (2.38)	165 (74)	46 (8)	30.06 (101.8)
				6th Gear (2H)					
43.3 (32.3)	2090 (9.3)	7.74 (12.46)	2204	5.6	0.590 (0.359)	11.88 (2.34)	163 (73)	46 (8)	30.06 (101.8)

DRAWBAR PERFORMANCE
FUEL CONSUMPTION CHARACTERISTICS
(Front Wheel Drive Disengaged)

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp °F (°C) cooling med	Temp °F (°C) Air dry bulb	Barom inch Hg (kPa)
				Maximum Power—5th (1H) Gear					
41.4 (30.9)	3215 (14.3)	4.85 (7.80)	2200	10.0	0.597 (0.363)	11.73 (2.31)	167 (75)	52 (11)	30.18 (102.2)
				75% of Pull at Maximum Power—5th (1H) Gear					
32.7 (24.4)	2405 (10.7)	5.10 (8.21)	2242	6.5	0.651 (0.396)	10.76 (2.12)	165 (74)	52 (11)	30.18 (102.2)
				50% of Pull at Maximum Power—5th (1H) Gear					
22.9 (17.1)	1620 (7.2)	5.28 (8.50)	2254	3.5	0.755 (0.459)	9.29 (1.83)	163 (73)	52 (11)	30.18 (102.2)
				75% of Pull at Reduced Engine Speed—6th (2H) Gear					
32.9 (24.5)	2405 (10.7)	5.11 (8.22)	1524	6.5	0.542 (0.330)	12.89 (2.54)	163 (73)	50 (10)	30.18 (102.2)
				50% of Pull at Reduced Engine Speed—6th (2H) Gear					
22.8 (17.0)	1620 (7.2)	5.28 (8.50)	1536	3.5	0.592 (0.360)	11.83 (2.33)	160 (71)	50 (10)	30.18 (102.2)

DRAWBAR PERFORMANCE
MAXIMUM POWER IN SELECTED GEARS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp °F (°C) cooling med	Temp °F (°C) Air dry bulb	Barom inch Hg (kPa)
				3rd Gear (3L)					
32.2 (24.0)	3890 (17.3)	3.11 (5.00)	2233	15.0	0.684 (0.416)	10.20 (2.01)	162 (72)	52 (11)	30.21 (102.3)
				4th Gear (4L)					
39.0 (29.1)	3865 (17.2)	3.79 (6.10)	2200	14.9	0.641 (0.390)	10.91 (2.15)	165 (74)	52 (11)	30.21 (102.3)
				5th Gear (1H)					
41.4 (30.9)	3215 (14.3)	4.85 (7.80)	2200	10.0	0.597 (0.363)	11.73 (2.31)	167 (75)	52 (11)	30.18 (102.2)
				6th Gear (2H)					
41.0 (30.6)	2070 (9.2)	7.46 (12.01)	2200	5.2	0.630 (0.383)	11.47 (2.26)	167 (75)	52 (11)	30.18 (102.2)

TRACTOR SOUND LEVEL WITHOUT CAB	Front Wheel Drive Disengaged dB(A)	Front Wheel Drive Engaged dB(A)
Maximum sound level	96.0	96.0
Bystander in 8th (4H) Gear	87.0	

TIRES AND WEIGHT		Tested Without Ballast
Rear Tires	—No., size, ply & psi (kPa)	Two 13.9R28; 6; 14 (100)
Front Tires	—No., size, ply & psi (kPa)	Two 11.2-20; 8; 16 (110)
Height of Drawbar		9.1 in. (230 mm) (4WD) 15.7 in. (400 mm) (2WD)
Static Weight	—Rear —Front —Total	3630 lb (1647 kg) 2545 lb (1155 kg) 6175 lb (2802 kg)

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with official OECD test procedures. The performance figures on this summary were taken from a test conducted under the OECD restricted standard test code procedure.

We, the undersigned, certify that this is a true summary of data from OECD Report No. **1258**, Nebraska Summary 073, March 6, 1991.

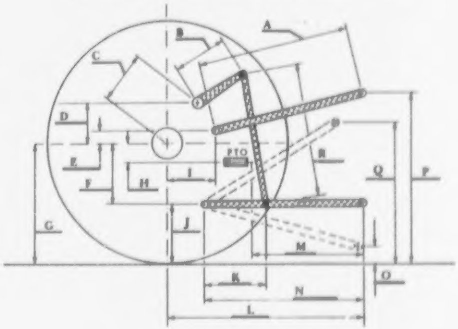
LOUIS I. LEVITICUS
Engineer in Charge

K. VON BARGEN
R. D. GRISSO
G. J. HOFFMAN
Board of Tractor Test Engineers

THREE POINT HITCH PERFORMANCE
(OECD Static Test)

CATEGORY: II	
Quick Attach: None	
Maximum Force Exerted Through Whole Range	3865 lbs (17.2 kN)
i) Opening pressure of relief valve	NA
Sustained pressure of the open relief valve	3300 psi (227 Bar)
ii) Pump delivery rate at minimum pressure	4.9 GPM (18.6 l/min)
iii) Pump delivery rate at maximum hydraulic power	4.6 GPM (17.4 l/min)
Delivery pressure	3050 psi (210 Bar)
Power	8.2 Hp (6.1 kW)

HITCH DIMENSIONS AS TESTED—NO LOAD



	inch	mm
A	26.5	673
B	10.5	267
C	12.0	304
D	9.2	233
E	8.1	205
F	8.3	212
G	25.2	640
H	5.3	135
I	7.3	186
J	16.9	428
K	16.9	428
L	33.6	853
M	21.9	557
N	34.8	885
O	7.9	200
P	36.9	938
Q	34.2	868
R	23.8	605

Agricultural Research Division
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Darrell Nelson, Dean and Director

NEBRASKA TRACTOR TEST 1604—CASE INTERNATIONAL 685 DIESEL
16 SPEED ALSO 8 SPEED
CHASSIS SERIAL NUMBERS -B510232B018001- AND HIGHER
(ALSO CASE INTERNATIONAL 695 DIESEL)

POWER TAKE-OFF PERFORMANCE (540 RPM SHAFT)

Power Hp (kW)	Crank shaft speed rpm	Fuel Consumption gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temperature °F (°C) Cooling medium	Air wet bulb	Air dry bulb	Barometer inch Hg (kPa)
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed — Two hours (PTO Speed — 606 rpm)								
61.02 (45.51)	2400	4.180 (15.821)	0.478 (0.291)	14.60 (2.876)	185 (85.0)	58 (14.5)	75 (23.8)	29.29 (98.91)
Standard Power Take-off Speed (540 rpm) — One Hour								
58.80 (43.85)	2141	3.984 (15.080)	0.473 (0.287)	14.76 (2.908)	188 (86.6)	58 (14.5)	75 (24.0)	29.30 (98.94)
VARYING POWER AND FUEL CONSUMPTION — Two Hours								
53.85 (40.16)	2491	3.772 (14.277)	0.489 (0.297)	14.27 (2.812)	184 (84.4)	58 (14.4)	75 (23.9)	
0.00 (0.00)	2660	1.527 (5.779)			178 (81.1)	58 (14.4)	75 (23.9)	
28.05 (20.91)	2597	2.542 (9.621)	0.632 (0.385)	11.03 (2.174)	181 (82.8)	58 (14.4)	76 (24.2)	
61.09 (45.55)	2401	4.128 (15.628)	0.471 (0.287)	14.80 (2.915)	186 (85.5)	58 (14.4)	75 (23.9)	
14.17 (10.57)	2627	2.086 (7.895)	1.027 (0.625)	6.79 (1.338)	178 (81.1)	58 (14.4)	75 (23.9)	
41.36 (30.84)	2550	3.109 (11.770)	0.524 (0.319)	13.30 (2.620)	183 (83.9)	58 (14.4)	75 (23.9)	
Av 33.08 Av (24.67)	**2554**	**2.861 (10.828)**	**0.605 (0.367)**	**11.56 (2.278)**	**182 (83.1)**	**58 (14.4)**	**75 (23.9)**	**29.29 (98.91)**

DRAWBAR PERFORMANCE

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank shaft speed rpm	Slip %	Fuel Consumption gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temp °F (°C) Cooling med	Air wet bulb	Air dry bulb	Barom. inch Hg (kPa)
Maximum Available Power — Two Hours 10th(1HDD) Gear											
52.90 (39.45)	2992 (13.31)	6.63 (10.67)	2399	4.62	4.179 (15.818)	0.551 (0.335)	12.66 (2.494)	187 (86.1)	54 (11.9)	57 (13.9)	28.97 (97.83)
75% of Pull at Maximum Power — Ten Hours 10th(1HDD) Gear											
42.25 (31.51)	2281 (10.15)	6.95 (11.18)	2485	3.57	3.564 (13.490)	0.588 (0.358)	11.86 (2.336)	184 (84.4)	36 (2.4)	42 (5.6)	28.91 (97.62)
50% of Pull at Maximum Power — Two Hours 10th(1HDD) Gear											
29.24 (21.81)	1521 (6.77)	7.21 (11.60)	2551	2.47	2.939 (11.124)	0.701 (0.426)	9.95 (1.960)	184 (84.2)	54 (12.2)	57 (13.9)	28.91 (97.62)
50% of Pull at Reduced Engine Speed — Two Hours 12th(2HDD) Gear											
29.20 (21.77)	1519 (6.76)	7.21 (11.60)	1569	2.45	2.380 (9.008)	0.569 (0.346)	12.27 (2.417)	185 (85.0)	55 (12.8)	58 (14.4)	28.87 (97.49)
MAXIMUM POWER IN SELECTED GEARS											
49.51 (36.92)	7207 (32.06)	2.58 (4.15)	2464	14.85	4th(2LDD) Gear			184 (84.2)	50 (10.0)	52 (11.1)	29.02 (98.00)
51.38 (38.32)	6660 (29.63)	2.89 (4.66)	2399	12.35	5th(3LTA) Gear			185 (84.7)	50 (10.0)	53 (11.7)	29.02 (98.00)
53.46 (39.87)	5551 (24.69)	3.61 (5.81)	2400	9.29	6th(3LDD) Gear			186 (85.3)	50 (10.0)	53 (11.7)	29.01 (97.96)
53.25 (39.69)	5123 (22.79)	3.90 (6.27)	2397	8.34	7th(4LTA) Gear			186 (85.3)	51 (10.6)	54 (12.2)	29.01 (97.96)
53.04 (39.55)	4153 (18.47)	4.79 (7.71)	2399	6.56	8th(4LDD) Gear			186 (85.3)	51 (10.6)	54 (12.2)	29.01 (97.96)
54.65 (40.74)	3777 (16.80)	5.42 (8.73)	2400	6.00	9th(1HTA) Gear			186 (85.6)	52 (11.1)	55 (12.8)	29.00 (97.93)
53.81 (40.13)	3041 (13.52)	6.64 (10.68)	2402	4.66	10th(1HDD) Gear			186 (85.6)	52 (11.1)	55 (12.8)	29.00 (97.93)
51.65 (38.52)	2142 (9.53)	9.04 (14.56)	2398	3.41	11th(2HTA) Gear			186 (85.6)	52 (11.1)	55 (12.8)	29.00 (97.93)

Department of Agricultural Engineering

Dates of Test: October 7 to 14, 1986

Manufacturer: J I CASE COMPANY, 700 State Street, Racine, Wisconsin 53404

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 49.5 (rating taken from oil company's inspection data) **Specific gravity converted to 60/60°F** *(15/15°C)* 0.8378 **Fuel weight** 6.976 lbs/gal *(0.836 kg/l)* **Oil SAE** 30 **API service classification** SF-CD **To motor** 2.125 gal *(8.044 l)* **Drained from motor** 2.055 gal *(7.778 l)* **Transmission and final drive lubricant** Case IH Hytran fluid **Total time engine was operated** 40.0 hours

ENGINE: Make Case International Diesel **Type** four cylinder vertical **Serial No.** 259DT2D482822* **Crankshaft** lengthwise **Rated rpm** 2400 **Bore and stroke** 3.875" × 5.06" *(98.4 mm × 128.5 mm)* **Compression ratio** 16 to 1 **Displacement** 239 cu in *(3913 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements **Oil filter** one full flow cartridge **Oil cooler** radiator for hydraulic and transmission oil **Fuel filter** two paper cartridges **Muffler** vertical **Cooling medium temperature control** one thermostat

CHASSIS: Type standard **Serial No.** -B510232B018063- **Tread width** rear 58" *(1473 mm)* to 100" *(2540 mm)* front 54" *(1372 mm)* to 79" *(2007 mm)* **Wheel base** 84.5" *(2146 mm)* **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center line of rear wheels 27.8" *(706 mm)* Vertical distance above roadway 30.3" *(770 mm)* Horizontal distance from center of rear wheel tread 0" *(0 mm)* to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with partial (2) range operator controlled powershift **Advertised speeds mph** *(km/h)* first 1.5 *(2.4)* second 1.8 *(2.8)* third 2.4 *(3.8)* fourth 2.9 *(4.6)* fifth 3.2 *(5.2)* sixth 3.9 *(6.2)* seventh 4.1 *(6.6)* eighth 5.0 *(8.0)* ninth 5.6 *(9.0)* tenth 6.8 *(10.9)* eleventh 9.1 *(14.6)* twelfth 11.0 *(17.7)* thirteenth 12.3 *(19.8)* fourteenth 14.8 *(23.9)* fifteenth 15.8 *(25.5)* sixteenth 19.1 *(30.7)* reverse 1.8 *(2.8)*, 2.1 *(3.4)*, 2.8 *(4.6)*, 3.4 *(5.5)*, 3.8 *(6.2)*, 4.6 *(7.5)*, 5.0 *(8.0)*, 6.0 *(9.6)* **Clutch** single dry disc operated by foot pedal **Brakes** single wet disc hydraulically operated by two foot pedals which can be locked together **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 122" *(3.10 m)* left 122" *(3.10 m)*(on concrete surface without brake) right 135" *(3.43 m)* left 135" *(3.43 m)* **Turning space diameter** (on concrete surface with brake applied) right 252" *(6.40 m)* left 252" *(6.40 m)*(on concrete surface without brake) right 280" *(7.11 m)* left 280" *(7.11 m)* **Power take-off** 540 rpm at 2141 engine rpm and 1000 rpm at 2192 engine rpm **Unladen tractor mass** 5660 lb *(2567 kg)*

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test codes and the technically equivalent ISO test codes or official Nebraska test procedure. For the maximum power tests, the fuel temperature at the injection pump return was maintained at 139°F *(59.2°C)*. Eight gears were chosen between 15% slip and 10 mph *(16.1 km/h)*. The performance figures on this report apply to chassis serial numbers -B510232B018001- and higher.

We, the undersigned, certify that this is as true and correct report of official Tractor Test No. **1604**, October 31, 1986.

NOTE: Report reissued, supplemental sales permit for Case International 695 Diesel, February, 1991.

LOUIS I. LEVITICUS
Engineer in Charge

K. VON BARGEN
L. L. BASHFORD
R. D. GRISSO, JR.
Board of Tractor Test Engineers

LUGGING ABILITY IN 10th(1HDD) GEAR

Crankshaft Speed rpm	2402	2170	1920	1686	1448	1214
Pull—lbs (kN)	3041 (13.52)	3293 (14.65)	3543 (15.76)	3667 (16.31)	3640 (16.19)	3576 (15.91)
Increase in Pull %	0	8	17	21	20	18
Power—Hp (kW)	53.81 (40.13)	52.41 (39.08)	49.81 (37.15)	44.97 (33.54)	38.44 (28.66)	31.67 (23.61)
Speed—Mph (km/h)	6.64 (10.68)	5.97 (9.60)	5.27 (8.49)	4.60 (7.40)	3.96 (6.37)	3.32 (5.34)
Slip %	4.66	5.04	5.30	5.81	5.56	5.56

TRACTOR SOUND LEVEL WITHOUT CAB	dB(A)
Maximum Available Power—Two Hours	97.0
75% of Pull at Maximum Power—Ten Hours	96.0
50% of Pull at Maximum Power—Two Hours	95.5
50% of Pull at Reduced Engine Speed—Two Hours	91.5
Bystander in 15th (4HTA) gear	89.5

POWER TAKE-OFF PERFORMANCE (1000 RPM SHAFT)

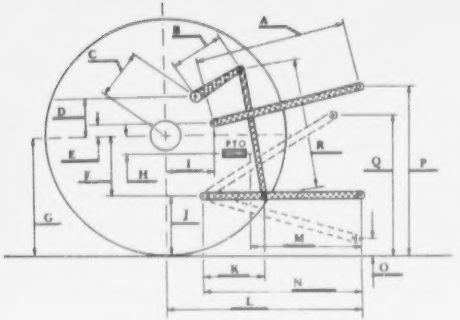
Power Hp (kW)	Crank shaft speed rpm	Fuel Consumption gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temperature °F (°C) Cooling medium	Air wet bulb	Air dry bulb	Barometer inch Hg (kPa)
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed — Two hours (PTO Speed — 1096 rpm)								
62.22 (46.40)	2401	4.189 (15.856)	0.470 (0.286)	14.85 (2.926)	186 (85.5)	62 (16.4)	75 (23.9)	28.95 (97.76)
Standard Power Take-off Speed (1000 rpm) — One Hour								
60.23 (44.92)	2192	4.002 (15.150)	0.464 (0.282)	15.05 (2.965)	187 (86.1)	62 (16.8)	75 (23.9)	28.94 (97.73)

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi (kPa)	Two 16.9-30; 6; 18 (124)	Two 16.9-30; 6; 18 (124)
Ballast	—Liquid (each)	705 lb (320 kg)	None
	—Cast iron (each)	750 lb (340 kg)	None
Front Tires	—No., size, ply & psi (kPa)	Two 7.50-16; 6; 28 (193)	Two 7.50-16; 6; 28 (193)
Ballast	—Liquid (each)	None	None
	—Cast iron (each)	50 lb (23 kg)	None
Height of Drawbar		18.5 in (470 mm)	18.5 in (470 mm)
Static Weight with Operator	—Rear	6870 lb (3116 kg)	3960 lb (1796 kg)
	—Front	1975 lb (896 kg)	1875 lb (851 kg)
	—Total	8845 lb (4012 kg)	5835 lb (2647 kg)

THREE POINT HITCH PERFORMANCE

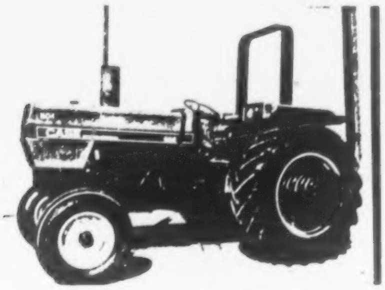
Observed Maximum Pressure psi (kPa)	2525	(17410)	
Location	remote outlet		
Hydraulic oil temperature °F (°C)	149	(65)	
Location	final drive		
	Maximum Lift Capacity		**Lift Capacity for Transport**
QUICK ATTACH	no		
CATEGORY	II		*not measured
LOAD lbs (kg)	3614	(1639)	
TIME sec	3.44		
HITCH POINT MOVEMENT in (mm)			
Lowest position	11.2	(284)	
Top of timed range	34.2	(869)	
Highest position	34.3**	(871)	
LOAD CG MOVEMENT in (mm)			
Lowest position	10.5	(267)	
Top of timed range	38.4	(975)	
Highest position	38.7	(983)	

*Implement load capacity for transport purposes not specified by manufacturer.
** The observed power range 23.1 in (587 mm) is less than the minimum power range for Cat II, 24 in (610 mm) specified by ASAE Standard S217.10.
** The observed highest position 34.3 in (871 mm) is less than the minimum height for highest position for Cat II, 36 in (914 mm) specified by ASAE Standard S217.10.



Hitch Dimensions as Tested — No Load

	inch	mm
A	24.8	*629*
B	11.8	*298*
C	11.6	*295*
D	11.3	*288*
E	9.0	*229*
F	7.5	*191*
G	26.3	*667*
H	0.3	*6*
I	11.0	*279*
J	18.8	*476*
K	21.8	*554*
L	35.9	*911*
M	19.9	*505*
N	32.1	*815*
O	8.0	*203*
P	37.8	*959*
Q	33.1	*841*
R	26.5	*673*



Case International 685 Diesel

Agricultural Research Division
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Irvin T. Omtvedt, Dean and Director

NEBRASKA TRACTOR TEST 1607—WHITE 160 DIESEL ALSO WHITE WORKHORSE 170 DIESEL

18 SPEED

POWER TAKE-OFF PERFORMANCE

Power Hp *(kW)*	Crank shaft speed rpm	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temperature °F (°C) Cooling medium	Air wet bulb	Air dry bulb	Barometer inch Hg *(kPa)*
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed — Two hours (PTO Speed — 1016 rpm)								
162.47 *(121.15)*	2200	9.239 *(34.974)*	0.393 *(0.239)*	17.59 *(3.464)*	183 *(83.9)*	62 *(16.6)*	75 *(24.1)*	28.69 *(96.87)*
Standard Power Take-off Speed (1000 rpm) — One Hour								
165.97 *(123.76)*	2167	9.335 *(35.336)*	0.389 *(0.236)*	17.78 *(3.501)*	183 *(84.1)*	61 *(16.5)*	75 *(23.9)*	28.69 *(96.88)*
VARYING POWER AND FUEL CONSUMPTION — Two Hours								
142.31 *(106.12)*	2271	8.365 *(31.656)*	0.406 *(0.247)*	17.02 *(3.352)*	182 *(83.1)*	61 *(16.1)*	74 *(23.3)*	
0.00 *(0.00)*	2389	2.816 *(10.661)*			177 *(80.5)*	62 *(16.7)*	75 *(23.9)*	
73.15 *(54.55)*	2324	5.320 *(20.140)*	0.503 *(0.306)*	13.75 *(2.709)*	180 *(82.2)*	62 *(16.7)*	75 *(23.6)*	
164.28 *(122.50)*	2199	9.213 *(34.875)*	0.388 *(0.236)*	17.83 *(3.513)*	184 *(84.2)*	62 *(16.7)*	76 *(24.2)*	
36.92 *(27.53)*	2345	4.092 *(15.491)*	0.766 *(0.466)*	9.02 *(1.777)*	177 *(80.6)*	62 *(16.4)*	75 *(23.9)*	
108.52 *(80.92)*	2294	6.796 *(25.725)*	0.434 *(0.264)*	15.94 *(3.140)*	180 *(82.2)*	62 *(16.7)*	76 *(24.2)*	
Av 87.50 *Av (65.25)*	**2303**	**6.100** *(23.091)*	**0.481** *(0.293)*	**14.36** *(2.828)*	**180** *(82.1)*	**62** *(16.5)*	**75** *(23.8)*	**28.68** *(96.86)*

DRAWBAR PERFORMANCE (Front Wheel Drive Engaged)

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank shaft speed rpm	Slip %	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temp. °F (°C) Cooling med	Air wet bulb	Air dry bulb	Barom inch Hg *(kPa)*
Maximum Available Power — Two Hours 12th (4D) Gear											
140.37 *(104.68)*	8441 *(37.55)*	6.24 *(10.04)*	2201	2.53	9.084 *(34.388)*	0.447 *(0.272)*	15.45 *(3.044)*	183 *(83.9)*	49 *(9.4)*	66 *(18.9)*	28.92 *(97.66)*
75% of Pull at Maximum Power — Ten Hours 12th (4D) Gear											
111.86 *(83.42)*	6437 *(28.63)*	6.52 *(10.49)*	2284	1.75	7.800 *(29.525)*	0.482 *(0.293)*	14.34 *(2.825)*	183 *(84.1)*	53 *(11.9)*	70 *(21.1)*	28.81 *(97.30)*
50% of Pull at Maximum Power — Two Hours 12th (4D) Gear											
76.08 *(56.74)*	4291 *(19.09)*	6.65 *(10.70)*	2320	1.28	6.301 *(23.850)*	0.563 *(0.342)*	12.29 *(2.421)*	181 *(82.8)*	40 *(4.4)*	52 *(10.8)*	29.10 *(98.25)*
50% of Pull at Reduced Engine Speed—Two Hours 15th (5O) Gear											
76.07 *(56.73)*	4291 *(19.09)*	6.65 *(10.70)*	1647	1.28	5.193 *(19.658)*	0.472 *(0.287)*	14.65 *(2.886)*	181 *(82.8)*	44 *(6.6)*	57 *(13.9)*	29.07 *(98.15)*

MAXIMUM POWER IN SELECTED GEARS

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank shaft speed rpm	Slip %	Gear	Cooling med	Air wet bulb	Air dry bulb	Barom inch Hg *(kPa)*
128.21 *(95.61)*	18055 *(80.31)*	2.66 *(4.29)*	2246	12.10	5th (2D) Gear	181 *(82.5)*	36 *(2.2)*	43 *(6.1)*	29.06 *(98.13)*
138.34 *(103.16)*	15667 *(69.69)*	3.31 *(5.33)*	2199	5.92	6th (2O) Gear	NA *NA*	44 *(6.7)*	53 *(11.7)*	28.97 *(97.83)*
139.18 *(103.79)*	13605 *(60.52)*	3.84 *(6.17)*	2200	4.46	7th (3U) Gear	182 *(83.3)*	44 *(6.7)*	53 *(11.7)*	28.97 *(97.83)*
142.57 *(106.31)*	11314 *(50.33)*	4.73 *(7.60)*	2199	3.55	8th (3D) Gear	182 *(83.3)*	44 *(6.7)*	53 *(11.7)*	28.97 *(97.83)*
140.61 *(104.85)*	10382 *(46.18)*	5.08 *(8.17)*	2200	3.15	9th (4U) Gear	182 *(83.3)*	46 *(7.8)*	59 *(15.0)*	28.98 *(97.86)*
139.22 *(103.82)*	9247 *(41.13)*	5.65 *(9.09)*	2200	2.71	10th (3O) Gear	183 *(83.6)*	46 *(7.8)*	59 *(15.0)*	28.98 *(97.86)*
140.53 *(104.80)*	8688 *(38.64)*	6.07 *(9.76)*	2199	2.62	11th (5U) Gear	182 *(83.3)*	46 *(7.8)*	59 *(15.0)*	28.98 *(97.86)*
142.74 *(106.44)*	8582 *(38.17)*	6.24 *(10.04)*	2202	2.54	12th (4D) Gear	182 *(83.3)*	48 *(8.9)*	63 *(17.2)*	28.96 *(97.79)*
138.81 *(103.51)*	7013 *(31.19)*	7.42 *(11.95)*	2200	2.11	13th (4O) Gear	182 *(83.3)*	46 *(7.8)*	59 *(15.0)*	28.98 *(97.86)*
142.60 *(106.33)*	7190 *(31.98)*	7.44 *(11.97)*	2201	1.93	14th (5D) Gear	182 *(83.3)*	46 *(7.8)*	59 *(15.0)*	28.98 *(97.86)*
137.54 *(102.57)*	5833 *(25.94)*	8.84 *(14.23)*	2199	1.67	15th (5O) Gear	182 *(83.3)*	46 *(7.8)*	59 *(15.0)*	28.98 *(97.96)*

Department of Agricultural Engineering

Dates of Test: April 5 to 19, 1988

Manufacturer: WHITE-NEW IDEA FARM EQUIPMENT COMPANY, Division of Allied Products, 123 West Sycamore Street, Coldwater, Ohio 45828

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 49.9 (rating taken from oil company's inspection data) **Specific gravity converted to 60/60°F** *(15/15°C)* 0.8303 **Fuel weight** 6.913 lbs/gal *(0.828 kg/l)* **Oil SAE** 15W40 **API service classification** CC, CD/SD, SE, SF **To motor** 5.263 gal *(19.921 l)* **Drained from motor** 4.497 gal *(17.022 l)* **Transmission and powershift lubricant** WFE universal fluid **Front axle lubricant** SAE 90 gear lubricant API GL-5 **Total time engine was operated** 39.5 hours

ENGINE: Make Consolidated Diesel Corporation-Cummins Diesel **Type** six cylinder vertical with turbocharger **Serial No.** 44207046 **Crankshaft** lengthwise **Rated rpm** 2200 **Bore and stroke** 4.49" × 5.32" *(114 mm × 135 mm)* **Compression ratio** 17.5 to 1 **Displacement** 504.5 cu in *(8270 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements and aspirator **Oil filter** one full flow cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, separate radiators for transmission and powershift oils **Fuel filter** two paper elements and water separator **Fuel cooler** radiator for injection pump return fuel **Muffler** vertical **Cooling medium temperature control** two thermostats

CHASSIS: Type front wheel assist with duals **Serial No.** *401099-160F* **Tread width** rear 65" *(1651 mm)* to 126" *(3200 mm)* front 65" *(1651 mm)* to 82.5" *(2096 mm)* **Wheel base** 91" *(2311 mm)* **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center line of rear wheels 34.2" *(867 mm)* Vertical distance above roadway 38.9" *(988 mm)* Horizontal distance from center of rear wheel tread 0" *(0 mm)* to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with partial (3) range operator controlled powershift **Advertised speeds mph *(km/h)*** first 1.8 *(2.9)* second 2.1 *(3.4)* third 2.3 *(3.7)* fourth 2.5 *(4.0)* fifth 2.8 *(4.5)* sixth 3.3 *(5.3)* seventh 3.8 *(6.1)* eighth 4.6 *(7.4)* ninth 4.9 *(7.9)* tenth 5.5 *(8.8)* eleventh 5.9 *(9.5)* twelfth 6.0 *(9.6)* thirteenth 7.1 *(11.4)* fourteenth 7.1 *(11.4)* fifteenth 8.5 *(13.7)* sixteenth 12.6 *(20.3)* seventeenth 15.3 *(24.7)* eighteenth 18.2 *(29.3)* reverse 2.0 *(3.2)*, 2.5 *(4.0)*, 3.0 *(4.8)*, 4.4 *(7.1)*, 5.4 *(8.7)*, 6.3 *(10.1)* **Clutch** dual dry disc operated by foot pedal **Brakes** multiple wet disc hydraulically power actuated by two foot pedals which can be locked together **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 163.5" *(4.15 m)* left 163.5"

LUGGING ABILITY IN 12th (4D) GEAR

Crankshaft Speed rpm	2202	1985	1763	1546	1318	1100
Pull—lbs *(kN)*	8582 *(38.17)*	10283 *(45.74)*	11587 *(51.54)*	12220 *(54.36)*	11997 *(53.37)*	10649 *(47.37)*
Increase in Pull %	0	20	35	42	40	24
Power—Hp *(kW)*	142.74 *(106.44)*	153.26 *(114.29)*	152.56 *(113.77)*	140.70 *(104.92)*	117.77 *(87.82)*	87.74 *(65.43)*
Speed—Mph *(km/h)*	6.24 *(10.04)*	5.59 *(8.99)*	4.94 *(7.95)*	4.32 *(6.95)*	3.68 *(5.92)*	3.09 *(4.97)*
Slip %	2.54	2.96	3.64	3.97	3.97	3.30

TRACTOR SOUND LEVEL WITH CAB	Front Wheel Drive Disengaged dB(A)	Front Wheel Drive Engaged dB(A)
Maximum Available Power—Two Hours	77.5	76.5
75% of Pull at Maximum Power—Ten Hours		76.5
50% of Pull at Maximum Power—Two Hours		76.5
50% of Pull at Reduced Engine Speed—Two Hours		76.5
Bystander in 18th (6D) gear	86.5	

DRAWBAR PERFORMANCE
(Front Wheel Drive Disengaged)

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr *(l/h)*	Fuel Consumption lb/hp.hr *(kg/kW.h)*	Fuel Consumption Hp.hr/gal *(kW.h/l)*	Temp. °F (°C) Cool-ing med	Temp. °F (°C) Air wet bulb	Temp. °F (°C) Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Available Power — Two hours 12th (4D) Gear											
138.42 *(103.22)*	8442 *(37.55)*	6.15 *(9.90)*	2199	3.48	9.077 *(34.36)*	0.453 *(0.276)*	15.25 *(3.004)*	181 *(82.8)*	51 *(10.6)*	70 *(20.8)*	28.88 *(97.52)*

MAXIMUM POWER IN SELECTED GEARS

113.41 *(84.57)*	13768 *(61.24)*	3.09 *(4.97)*	2272	14.76	5th (2D) Gear	181 *(82.8)*	38 *(3.3)*	47 *(8.3)*	29.08 *(98.20)*
142.52 *(106.28)*	8674 *(38.58)*	6.16 *(9.92)*	2201	3.44	12th (4D) Gear	182 *(83.3)*	46 *(7.8)*	59 *(15.0)*	28.98 *(97.86)*

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi *(kPa)*	Four 20.8R38; 8; 12 *(83)*	Four 20.8R38; 8; 12 *(83)*
Ballast	—Liquid (each)	None	None
	—Effect of front wts (each)	90 lb *(41 kg)*	None
Front Tires	—No., size, ply & psi *(kPa)*	Two 18.4-26; 8; 16 *(110)*	Two 18.4-26; 8; 16 *(110)*
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	960 lb *(436 kg)*	None
Height of Drawbar		22.5 in *(572 mm)*	22.5 in *(572 mm)*
Static Weight with Operator	—Rear	11050 lb *(5012 kg)*	11410 lb *(5176 kg)*
	—Front	7800 lb *(3538 kg)*	5880 lb *(2667 kg)*
	—Total	18850 lb *(8550 kg)*	17290 lb *(7843 kg)*

THREE POINT HITCH PERFORMANCE

Observed Maximum Pressure psi *(kPa)*	2275	*(15690)*
Location	remote outlet	
Hydraulic oil temperature °F *(°C)*	161	*(72)*
Location	pump inlet	

	Maximum Lift Capacity	
QUICK ATTACH	yes	
CATEGORY	III	
LOAD lbs *(kg)*	*7035	*(3191)*
TIME sec	5.42	
HITCH POINT MOVEMENT in *(mm)*		
Lowest position	14.1	*(358)*
Top of timed range	40.1	*(1019)*
Highest position	40.1	*(1019)*
LOAD C.G. MOVEMENT in *(mm)*		
Lowest position	13.0	*(330)*
Top of timed range	45.0	*(1143)*
Highest position	45.0	*(1143)*

*Manufacturers claim was 8000 lb *(3628 kg)*

(4.15 m)(on concrete surface without brake) right 212.5" *(5.40 m)* left 212.5" *(5.40 m)* **Turning space diameter** (on concrete surface with brake applied) right 345.5" *(8.78 m)* left 345.5" *(8.78 m)*(on concrete surface without brake) right 452.5" *(11.49 m)* left 452.5" *(11.49 m)* **Power take-off** 1000 rpm at 2167 engine rpm **Unladen tractor mass** 15610 lb *(7081 kg)*

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

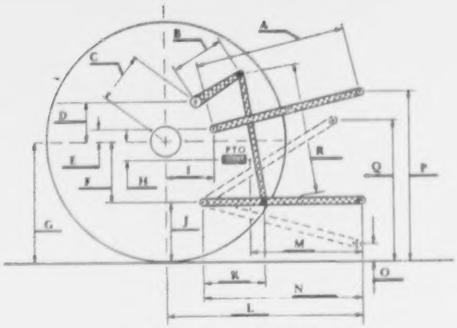
REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test codes and the technically equivalent ISO test codes or official Nebraska test procedure. For the maximum power tests, the fuel temperature at the injection pump was maintained at 130 °F *(54°C)*. Eleven gears were chosen between 15% slip and 10 mph *(16.1 km/h)*. The pull in 5th (2D) gear was limited to avoid tractor bouncing.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1607**, May 17, 1988.

Note: Report reissued, supplemental sales permit for White Workhorse 170 Diesel November, 1991.

LOUIS I. LEVITICUS
Engineer-in-charge

K. VON BARGEN
R. D. GRISSO
L. L. BASHFORD
Board of Tractor Test Engineers



Hitch Dimensions as Tested — No Load

	inch	mm
A	24.6	*625*
B	16.0	*406*
C	20.1	*511*
D	18.6	*472*
E	10.4	*263*
F	10.2	*260*
G	33.1	*841*
H	1.9	*48*
I	19.9	*505*
J	22.9	*581*
K	22.3	*566*
L	45.3	*1151*
L'	49.9	*1267*
M	23.4	*594*
N	34.8	*884*
O	6.5	*165*
P	46.3	*1175*
Q	36.5	*927*
R	39.9	*1013*

L' to end of quick attach

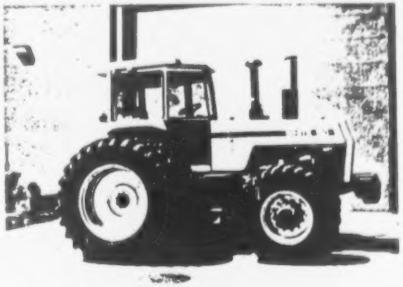
WHITE WORKHORSE 170 DIESEL
THREE POINT HITCH PERFORMANCE
(From Nebraska Tractor Test 1635)
DEUTZ ALLIS 9190 DIESEL

Observed Maximum Pressure psi *(kPa)*	2500	*(17235)*
Location	remote outlet	
Hydraulic oil temperature °F *(°C)*	179	*(82)*
Location	hydraulic suction line	

	Maximum Lift Capacity			
QUICK ATTACH	No		Yes	
CATEGORY	III		III	
LOAD lbs *(kg)*	9810	*(4450)*	7966	*(3613)*
TIME sec	8.63		5.53	
HITCH POINT MOVEMENT in *(mm)*				
Lowest position	14.0	*(356)*	13.2	*(335)*
Top of timed range	*39.2	*(996)*	40.0	*(1016)*
Highest position	**39.2	*(996)*	40.2	*(1021)*
LOAD C.G. MOVEMENT in *(mm)*				
Lowest position	14.1	*(357)*	13.3	*(337)*
Top of timed range	40.7	*(1033)*	41.5	*(1053)*
Highest position	40.7	*(1033)*	41.7	*(1058)*

*The observed power range 25.2" *(643 mm)* does not meet the minimum power range 26.0" *(660 mm)* specified by ASAE Standard S217.10.

**The observed highest position 39.2" *(996 mm)* is less than the minimum height for highest position for Cat III, 40.0" *(1016 mm)* specified by ASAE Standard S217.10.



White 160 Diesel

Agricultural Research Division
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Darrell Nelson, Dean and Director

NEBRASKA TRACTOR TEST 1608—FIELD BOSS 185 DIESEL
ALSO WHITE 185 DIESEL
ALSO WHITE WORKHORSE 195 DIESEL
18 SPEED

POWER TAKE-OFF PERFORMANCE

Power Hp (kW)	Crank shaft speed rpm	Fuel Consumption gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temperature °F (°C) Cooling medium	Air wet bulb	Air dry bulb	Barometer inch Hg (kPa)
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed — Two hours (PTO Speed — 1015 rpm)								
187.55 *(139.85)*	2200	10.923 *(41.348)*	0.403 *(0.245)*	17.17 *(3.382)*	183 *(83.9)*	61 *(15.9)*	75 *(24.0)*	29.04 *(98.07)*
Standard Power Take-off Speed (1000 rpm) — One Hour								
192.38 *(143.45)*	2167	11.086 *(41.966)*	0.398 *(0.242)*	17.35 *(3.418)*	183 *(83.9)*	61 *(16.0)*	76 *(24.4)*	29.02 *(98.00)*
VARYING POWER AND FUEL CONSUMPTION — Two Hours								
161.45 *(120.39)*	2227	9.682 *(36.649)*	0.415 *(0.252)*	16.68 *(3.285)*	182 *(83.3)*	61 *(16.1)*	76 *(24.4)*	
0.00 *(0.00)*	2368	3.059 *(11.581)*			178 *(81.1)*	61 *(15.8)*	75 *(23.8)*	
82.73 *(61.69)*	2296	6.149 *(23.278)*	0.514 *(0.313)*	13.45 *(2.650)*	180 *(82.2)*	61 *(16.1)*	77 *(24.7)*	
188.10 *(140.27)*	2199	10.693 *(40.477)*	0.393 *(0.239)*	17.59 *(3.465)*	183 *(83.9)*	63 *(16.9)*	78 *(25.3)*	
41.82 *(31.19)*	2312	4.665 *(17.659)*	0.771 *(0.469)*	8.97 *(1.766)*	179 *(81.7)*	62 *(16.8)*	77 *(24.7)*	
122.59 *(91.41)*	2254	7.794 *(29.504)*	0.440 *(0.267)*	15.73 *(3.098)*	181 *(82.8)*	62 *(16.8)*	77 *(25.0)*	
Av 99.45 **Av *(74.16)***	**2274**	**7.007** ***(26.525)***	**0.487** ***(0.296)***	**14.19** ***(2.796)***	**181** ***(82.5)***	**61** ***(16.1)***	**76** ***(24.7)***	**28.98** ***(97.86)***

DRAWBAR PERFORMANCE
(Front Wheel Drive Engaged)

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank shaft speed rpm	Slip %	Fuel Consumption gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temp °F (°C) Cooling med	Air wet bulb	Air dry bulb	Barom inch Hg (kPa)
Maximum Available Power — Two Hours 12th (4D) Gear											
163.56 *(121.96)*	9909 *(44.08)*	6.19 *(9.96)*	2201	3.04	10.755 *(40.712)*	0.455 *(0.277)*	15.21 *(2.996)*	182 *(83.3)*	44 *(6.7)*	58 *(14.7)*	29.07 *(98.15)*
75% of Pull at Maximum Power — Ten Hours 12th (4D) Gear											
128.45 *(95.77)*	7575 *(33.70)*	6.36 *(10.23)*	2240	2.07	8.957 *(33.906)*	0.482 *(0.293)*	14.34 *(2.825)*	182 *(83.3)*	58 *(14.5)*	77 *(24.8)*	28.67 *(96.80)*
50% of Pull at Maximum Power — Two Hours 12th (4D) Gear											
88.63 *(66.09)*	5117 *(22.76)*	6.50 *(10.45)*	2275	1.52	7.146 *(27.050)*	0.557 *(0.339)*	12.40 *(2.443)*	181 *(82.8)*	59 *(15.0)*	81 *(26.9)*	28.80 *(97.25)*
50% of Pull at Reduced Engine Speed — Two Hours 15th (5O) Gear											
88.82 *(66.23)*	5118 *(22.76)*	6.51 *(10.47)*	1618	1.52	5.953 *(22.535)*	0.463 *(0.282)*	14.92 *(2.939)*	181 *(82.5)*	60 *(15.3)*	82 *(27.8)*	28.76 *(97.12)*
MAXIMUM POWER IN SELECTED GEARS											
152.35 *(113.61)*	18318 *(81.48)*	3.12 *(5.02)*	2203	11.51	6th (2O) Gear			180 *(82.2)*	36 *(2.2)*	41 *(5.0)*	29.09 *(98.23)*
161.45 *(120.39)*	16061 *(71.44)*	3.77 *(6.07)*	2201	6.07	7th (3U) Gear			181 *(82.5)*	41 *(5.0)*	49 *(9.4)*	29.11 *(98.30)*
165.54 *(123.44)*	13256 *(58.97)*	4.68 *(7.54)*	2201	4.29	8th (3D) Gear			181 *(82.5)*	41 *(5.0)*	49 *(9.4)*	29.11 *(98.30)*
163.83 *(122.17)*	12194 *(54.24)*	5.04 *(8.11)*	2201	3.71	9th (4U) Gear			181 *(82.5)*	43 *(6.1)*	53 *(11.7)*	29.11 *(98.30)*
163.35 *(121.81)*	10931 *(48.62)*	5.60 *(9.02)*	2201	3.29	10th (3O) Gear			181 *(82.5)*	43 *(6.1)*	53 *(11.7)*	29.11 *(98.30)*
162.51 *(121.19)*	10112 *(44.98)*	6.03 *(9.70)*	2200	3.04	11th (5U) Gear			182 *(83.1)*	43 *(6.1)*	53 *(11.7)*	29.11 *(98.30)*
167.72 *(125.07)*	10177 *(45.27)*	6.18 *(9.95)*	2198	3.12	12th (4D) Gear			182 *(83.1)*	43 *(6.1)*	54 *(12.2)*	29.12 *(98.33)*
163.09 *(121.62)*	8292 *(36.88)*	7.38 *(11.87)*	2201	2.53	13th (4O) Gear			181 *(82.8)*	43 *(6.1)*	53 *(11.7)*	29.11 *(98.30)*
166.53 *(124.18)*	8460 *(37.63)*	7.38 *(11.88)*	2200	2.61	14th (5D) Gear			181 *(82.8)*	43 *(6.1)*	53 *(11.7)*	29.11 *(98.30)*
159.30 *(118.79)*	6804 *(30.26)*	8.78 *(14.13)*	2200	2.01	15th (5O) Gear			181 *(82.5)*	43 *(6.1)*	54 *(12.2)*	29.12 *(98.33)*

Department of Agricultural Engineering

Dates of Test: April 5 to 18, 1988

Manufacturer: WHITE NEW IDEA FARM EQUIPMENT COMPANY, Division of Allied Products, 123 West Sycamore Street, Coldwater, Ohio 45828

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 49.9 (rating taken from oil company's inspection data) **Specific gravity converted to 60/60°F** *(15/15°C)* 0.8303 **Fuel weight** 6.913 lbs/gal *(0.828 kg/l)* **Oil SAE** 15W40 **API service classification** CC, CD/SD, SE, SF **To motor** 5.311 gal *(20.106 l)* **Drained from motor** 4.778 gal *(18.088 l)* **Transmission and powershift lubricant** WFE universal fluid **Front axle lubricant** SAE 90 gear lubricant API GL-5 **Total time engine was operated** 38.5 hours

ENGINE: Make Consolidated Diesel Corporation/Cummins Diesel **Type** six cylinder vertical with turbocharger and intercooler **Serial No.** 44195714 **Crankshaft** lengthwise **Rated rpm** 2200 **Bore and stroke** 4.49" × 5.32" *(114 mm × 135 mm)* **Compression ratio** 16.5 to 1 **Displacement** 504.5 cu in *(8270 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements and aspirator **Oil filter** one full flow cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, separate radiators for transmission and powershift oils **Fuel filter** two paper elements and water separator **Fuel cooler** radiator for injection pump return fuel **Muffler** vertical **Cooling medium temperature control** two thermostats

CHASSIS: Type front wheel assist with duals **Serial No.** *101029-1851* **Tread width** rear 65" *(1651 mm)* to 126" *(3200 mm)* front 65" *(1651 mm)* to 82.5" *(2096 mm)* **Wheel base** 91" *(2311 mm)* **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center-line of rear wheels 34.6" *(880 mm)* Vertical distance above roadway 38.9" *(988 mm)* Horizontal distance from center of rear wheel tread 0" *(0 mm)* to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with partial (3) range operator controlled powershift **Advertised speeds mph *(km/h)*** first 1.8 *(2.9)* second 2.1 *(3.4)* third 2.3 *(3.7)* fourth 2.5 *(4.0)* fifth 2.8 *(4.5)* sixth 3.3 *(5.3)* seventh 3.8 *(6.1)* eighth 4.6 *(7.4)* ninth 4.9 *(7.9)* tenth 5.5 *(8.8)* eleventh 5.9 *(9.5)* twelfth 6.0 *(9.6)* thirteenth 7.1 *(11.4)* fourteenth 7.1 *(11.4)* fifteenth 8.5 *(13.7)* sixteenth 12.6 *(20.3)* seventeenth 15.3 *(24.7)* eighteenth 18.2 *(29.3)* reverse 2.0 *(3.2)*, 2.5 *(4.0)*, 3.0 *(4.8)*, 4.4 *(7.1)*, 5.4 *(8.7)*, 6.3 *(10.1)* **Clutch** dual dry disc operated by foot pedal **Brakes** multiple wet disc hydraulically power actuated by two foot pedals which can be locked together **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 163.5" *(4.15 m)* left 163.5" *(4.15 m)* (on concrete surface without brake) right 212.5" *(5.40 m)* left 212.5" *(5.40 m)* **Turning space diameter** (on concrete surface with brake applied) right 345.5" *(8.78 m)* left 345.5" *(8.78 m)* (on concrete surface without brake) right 452.5" *(11.49 m)* left 452.5" *(11.49 m)* **Power take-off** 1000 rpm at 2167 engine rpm **Unladen tractor mass** 15545 lb *(7051 kg)*

LUGGING ABILITY IN 12th (4D) GEAR

Crankshaft Speed rpm	2198	1975	1757	1549	1312	1102
Pull—lbs *(kN)*	10177 *(45.27)*	12326 *(54.83)*	13926 *(61.95)*	14427 *(64.17)*	13569 *(60.36)*	11794 *(52.46)*
Increase in Pull %	0	21	37	42	33	16
Power—Hp *(kW)*	167.72 *(125.07)*	181.15 *(135.08)*	180.85 *(134.86)*	164.08 *(122.36)*	131.67 *(98.19)*	96.79 *(72.18)*
Speed—Mph *(km/h)*	6.18 *(9.95)*	5.51 *(8.87)*	4.87 *(7.84)*	4.27 *(6.86)*	3.64 *(5.86)*	3.08 *(4.95)*
Slip %	3.12	3.79	4.45	4.62	4.12	3.79

TRACTOR SOUND LEVEL WITH CAB	Front Wheel Drive Disengaged dB(A)	Front Wheel Drive Engaged dB(A)
Maximum Available Power—Two Hours	77.0	76.5
75% of Pull at Maximum Power—Ten Hours		76.5
50% of Pull at Maximum Power—Two Hours		76.5
50% of Pull at Reduced Engine Speed—Two Hours		75.5
Bystander in 18th (6H) gear	87.5	

DRAWBAR PERFORMANCE
(Front Wheel Drive Disengaged)

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank shaft speed rpm	Slip %	Fuel Consumption gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temp °F (°C) Cooling med	Air wet bulb	Air dry bulb	Barom inch Hg (kPa)
Maximum Available Power — Two hours 12th (4D) Gear											
163.35 *(121.81)*	10062 *(44.76)*	6.09 *(9.80)*	2200	4.28	10.741 *(40.658)*	0.455 *(0.277)*	15.21 *(2.996)*	182 *(83.3)*	46 *(7.8)*	61 *(16.1)*	29.02 *(97.98)*
MAXIMUM POWER IN SELECTED GEARS											
133.66 *(99.67)*	14487 *(64.44)*	3.46 *(5.57)*	2223	14.29	7th (3U) Gear			181 *(82.5)*	36 *(2.2)*	41 *(5.0)*	29.09 *(98.23)*
166.42 *(124.10)*	10229 *(45.50)*	6.10 *(9.82)*	2200	4.05	12th (4D) Gear			181 *(82.8)*	43 *(6.1)*	54 *(12.2)*	29.12 *(98.33)*

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi *(kPa)*	Four 20.8R38; 8; 12 *(83)*	Four 20.8R38; 8; 12 *(83)*
Ballast	—Liquid (each)	None	None
	—Effect of front wts (each)	750 lb *(340 kg)*	None
Front Tires	—No., size, ply & psi *(kPa)*	Two 18.4R26; 8; 16 *(110)*	Two 18.4R26; 8; 16 *(110)*
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	968 lb *(439 kg)*	None
Height of Drawbar		22 in *(560 mm)*	22 in *(560 mm)*
Static Weight with Operator	—Rear	10935 lb *(4960 kg)*	11250 lb *(5103 kg)*
	—Front	7835 lb *(3554 kg)*	5900 lb *(2676 kg)*
	—Total	18770 lb *(8514 kg)*	17150 lb *(7779 kg)*

THREE POINT HITCH PERFORMANCE

Observed Maximum Pressure psi *(kPa)*	2275	*(15690)*
Location	remote outlet	
Hydraulic oil temperature °F *(°C)*	164	*(73)*
Location	pump inlet	
	Maximum Lift Capacity	
QUICK ATTACH	yes	
CATEGORY	III	
LOAD lbs *(kg)*	*7035	*(3191)*
TIME sec	7.56	
HITCH POINT MOVEMENT in *(mm)*		
Lowest position	13.9	*(353)*
Top of travel range	39.9	*(1013)*
Highest position	40.0	*(1016)*
LOAD CG MOVEMENT in *(mm)*		
Lowest position	12.9	*(328)*
Top of travel range	45.1	*(1146)*
Highest position	45.3	*(1151)*

*Manufacturers claim was 8000 lb *(3628 kg)*

REPAIRS AND ADJUSTMENTS: No repairs or adjustments

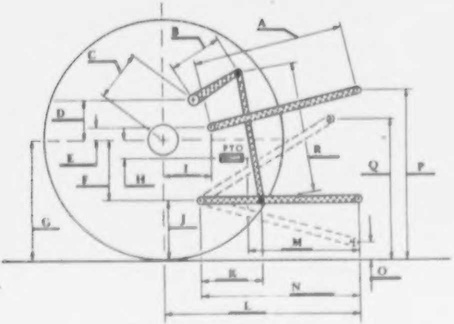
REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test codes and the technically equivalent ISO test codes or official Nebraska test procedure. For the maximum power tests, the fuel temperature at the injection pump was maintained at 126 °F *(52.2°C)*. Ten gears were chosen between 15% slip and 10 mph *(16.1 km/h)*. The pull in 6th (2O) gear was limited to avoid tractor bouncing.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1608**, May 17, 1988.

Note: Report reissued, supplemental sales permit for White Workhorse 195 Diesel November, 1991.

LOUIS I. LEVITICUS
Engineer-in-charge

K. VON BARGEN
R. D. GRISSO
L. L. BASHFORD
Board of Tractor Test Engineers



Hitch Dimensions as Tested — No Load

	inch	mm
A	24.5	622
B	16.0	406
C	20.1	511
D	18.6	472
E	10.4	264
F	10.2	260
G	33.1	841
H	1.9	48
I	19.9	505
J	22.9	581
K	22.3	566
L	45.3	1151
L	49.9	1267
M	23.4	594
N	34.8	884
O	6.5	165
P	46.3	1175
Q	36.3	921
R	39.9	1013

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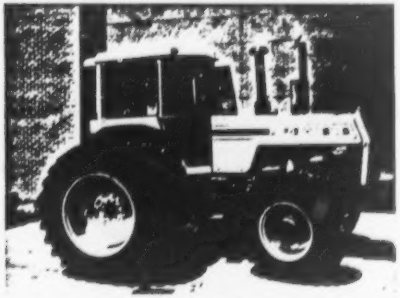
WHITE WORKHORSE 195 DIESEL THREE POINT HITCH PERFORMANCE (From Nebraska Tractor Test 1635) DEUTZ ALLIS 9190 DIESEL

Observed Maximum Pressure psi *(kPa)*	2500	*(17235)*		
Location	remote outlet			
Hydraulic oil temperature °F *(°C)*	179	*(82)*		
Location	hydraulic suction line			
	Maximum Lift Capacity			
QUICK ATTACH	No		Yes	
CATEGORY	III		III	
LOAD lbs *(kg)*	9898	*(4490)*	7966	*(3613)*
TIME sec	8.63		5.55	
HITCH POINT MOVEMENT in *(mm)*				
Lowest position	14.0	*(356)*	13.2	*(335)*
Top of timed range	*39.2	*(996)*	40.0	*(1016)*
Highest position	**39.2	*(996)*	40.2	*(1021)*
LOAD CG MOVEMENT in *(mm)*				
Lowest position	14.1	*(357)*	13.3	*(337)*
Top of timed range	40.7	*(1033)*	41.5	*(1053)*
Highest position	40.7	*(1033)*	41.7	*(1058)*

*The observed power range 25.2" *(645 mm)* does not meet the minimum power range 26.0" *(660 mm)* specified by ASAE Standard S217.10

**The observed highest position 39.2" *(996 mm)* is less than the minimum height for highest position for Cat III, 40.0" *(1016 mm)* specified by ASAE Standard S217.10



Field Boss 185 Diesel

Agricultural Research Division
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Darrell Nelson, Dean and Director

NEBRASKA TRACTOR TEST 1615—WHITE 120 DIESEL ALSO WHITE WORKHORSE 125 DIESEL 18 SPEED

POWER TAKE-OFF PERFORMANCE

Power Hp *(kW)*	Crank shaft speed rpm	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temperature °F *(°C)* Cooling medium	Air wet bulb	Air dry bulb	Barometer inch Hg *(kPa)*
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed — Two hours (PTO Speed — 1016 rpm)								
119.15 *(88.85)*	2200	7.105 *(26.897)*	0.412 *(0.251)*	16.77 *(3.304)*	187 *(86.2)*	66 *(18.9)*	74 *(23.3)*	28.96 *(97.78)*
Standard Power Take-off Speed (1000 rpm) — One Hour								
121.94 *(90.93)*	2166	7.198 *(27.248)*	0.408 *(0.248)*	16.94 *(3.337)*	187 *(86.2)*	67 *(19.4)*	78 *(25.5)*	28.95 *(97.76)*
VARYING POWER AND FUEL CONSUMPTION — Two Hours								
105.48 *(78.66)*	2240	6.438 *(24.372)*	0.430 *(0.262)*	16.07 *(3.166)*	186 *(85.6)*	67 *(19.2)*	78 *(25.6)*	
0.85 *(0.63)*	2422	2.492 *(9.433)*		0.34 *(0.067)*	182 *(83.3)*	69 *(20.5)*	79 *(25.8)*	
53.38 *(39.81)*	2319	4.381 *(16.582)*	0.567 *(0.345)*	12.19 *(2.400)*	184 *(84.2)*	70 *(20.8)*	79 *(25.8)*	
118.82 *(88.60)*	2200	7.072 *(26.772)*	0.411 *(0.250)*	16.80 *(3.310)*	188 *(86.6)*	68 *(20.0)*	80 *(26.4)*	
27.10 *(20.21)*	2354	3.417 *(12.934)*	0.871 *(0.530)*	7.93 *(1.563)*	181 *(82.8)*	70 *(20.8)*	80 *(26.7)*	
78.81 *(58.77)*	2282	5.370 *(20.329)*	0.471 *(0.286)*	14.68 *(2.891)*	185 *(84.7)*	69 *(20.6)*	79 *(26.1)*	
Av 63.74 **Av *(47.53)***	**2304**	**4.862** ***(18.404)***	**0.527** ***(0.321)***	**13.11** ***(2.583)***	**184** ***(84.4)***	**69** ***(20.3)***	**79** ***(26.1)***	**28.94** ***(97.71)***

DRAWBAR PERFORMANCE

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank shaft speed rpm	Slip %	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temp °F *(°C)* Cooling med	Air wet bulb	Air dry bulb	Barom inch Hg *(kPa)*
Maximum Available Power — Two Hours 11th (4D) Gear											
103.03 *(76.83)*	5835 *(25.95)*	6.62 *(10.66)*	2197	2.50	6.985 *(26.442)*	0.468 *(0.285)*	14.76 *(2.907)*	187 *(86.1)*	67 *(19.2)*	74 *(23.3)*	28.96 *(97.79)*
75% of Pull at Maximum Power — Ten Hours 11th (4D) Gear											
81.37 *(60.68)*	4445 *(19.77)*	6.86 *(11.04)*	2275	2.27	5.994 *(22.691)*	0.509 *(0.310)*	13.57 *(2.674)*	190 *(87.9)*	62 *(16.8)*	65 *(18.1)*	28.75 *(97.09)*
50% of Pull at Maximum Power — Two Hours 11th (4D) Gear											
55.72 *(41.55)*	2963 *(13.18)*	7.05 *(11.35)*	2314	1.55	4.848 *(18.352)*	0.601* *(0.366)*	11.49 *(2.264)*	183 *(83.6)*	70 *(20.8)*	81 *(26.9)*	28.90 *(97.59)*
50% of Pull at Reduced Engine Speed — Two Hours 15th (5O) Gear											
55.70 *(41.53)*	2963 *(13.18)*	7.05 *(11.34)*	1984	1.51	3.828 *(14.490)*	0.475 *(0.289)*	14.55 *(2.866)*	177 *(80.3)*	56 *(13.3)*	59 *(14.7)*	28.88 *(97.51)*
MAXIMUM POWER IN SELECTED GEARS											
82.14 *(61.25)*	14286 *(63.55)*	2.16 *(3.47)*	2248	15.92	3rd (1O) Gear			184 *(84.4)*	60 *(15.6)*	62 *(16.7)*	28.94 *(97.73)*
101.04 *(75.35)*	12598 *(56.04)*	3.01 *(4.84)*	2199	6.21	4th (2U) Gear			188 *(86.4)*	60 *(15.6)*	63 *(17.2)*	28.94 *(97.73)*
104.21 *(77.71)*	10576 *(47.04)*	3.70 *(5.95)*	2200	4.43	5th (2D) Gear			187 *(86.1)*	61 *(16.1)*	63 *(17.2)*	28.95 *(97.76)*
101.13 *(75.41)*	9475 *(42.14)*	4.00 *(6.44)*	2201	3.77	6th (3U) Gear			185 *(85.0)*	61 *(16.1)*	64 *(17.8)*	28.95 *(97.76)*
102.65 *(76.55)*	8604 *(38.27)*	4.47 *(7.20)*	2200	3.44	7th (2O) Gear			188 *(86.7)*	62 *(16.7)*	65 *(18.3)*	28.96 *(97.79)*
104.19 *(77.70)*	8060 *(35.85)*	4.85 *(7.80)*	2198	3.27	8th (3D) Gear			185 *(84.7)*	62 *(16.7)*	64 *(17.8)*	28.95 *(97.76)*
103.39 *(77.10)*	7078 *(31.48)*	5.48 *(8.82)*	2198	2.76	9th (4U) Gear			185 *(84.7)*	65 *(18.3)*	68 *(20.0)*	28.97 *(97.81)*
101.22 *(75.48)*	6488 *(28.86)*	5.85 *(9.42)*	2199	2.67	10th (3O) Gear			186 *(85.6)*	63 *(17.2)*	65 *(18.3)*	28.96 *(97.79)*
104.69 *(78.07)*	5926 *(26.36)*	6.62 *(10.66)*	2198	2.42	11th (4D) Gear			187 *(86.1)*	65 *(18.3)*	70 *(21.1)*	28.98 *(97.86)*
101.92 *(76.00)*	4958 *(22.05)*	7.71 *(12.41)*	2199	2.16	12th (5U) Gear			185 *(85.0)*	63 *(17.2)*	66 *(18.9)*	28.96 *(97.79)*
101.93 *(76.01)*	4792 *(21.32)*	7.98 *(12.84)*	2200	2.07	13th (4O) Gear			185 *(84.7)*	64 *(17.8)*	66 *(18.9)*	28.97 *(97.83)*
102.30 *(76.28)*	4118 *(18.32)*	9.32 *(14.99)*	2201	1.90	14th (5D) Gear			191 *(88.1)*	64 *(17.8)*	68 *(20.0)*	28.97 *(97.83)*

Department of Agricultural Engineering

Dates of Test: September 21 to October 4, 1988

Manufacturer: WHITE-NEW IDEA FARM EQUIPMENT COMPANY, Division of Allied Products, 123 West Sycamore Street, Coldwater, Ohio 45828

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 51.2 (rating taken from oil company's inspection data) **Specific gravity converted to 60/60°F** *(15/15°C)* 0.8299 **Fuel weight** 6.910 lbs/gal *(0.828 kg/l)* **Oil SAE** 15W-40 **API service classification** CC, CD/SD, SE, SF **To motor** 3.968 gal *(15.022 l)* **Drained from motor** 3.419 gal *(12.942 l)* **Transmission and final drive lubricant** White Farm Equipment Universal Fluid **Total time engine was operated** 54.0 hours

ENGINE: Make Consolidated Diesel Corporation-Cummins Diesel **Type** six cylinder vertical with turbocharger **Serial No.** 44229160 **Crankshaft** lengthwise **Rated rpm** 2200 **Bore and stroke** 4.02" × 4.72" *(102 mm × 120 mm)* **Compression ratio** 18.5 to 1 **Displacement** 359 cu in *(5880 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements and aspirator **Oil filter** one full flow cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, separate radiators for transmission and powershift oils **Fuel filter** one paper cartridge and prestrainer **Muffler** underhood **Exhaust** vertical **Cooling medium temperature control** one thermostat

ENGINE OPERATING PARAMETERS: Maximum fuel rate 50.71 lb/hr *(23.00 kg/hr)* **High idle** 2325-2425 rpm **Turbo boost** nominal 13.75 psi *(95 kPa)* as measured 13.0 psi *(90 kPa)*

CHASSIS: Type standard with duals **Serial No.** *401214-120T* **Tread width** rear 64" *(1625 mm)* to 123" *(3125 mm)* front 61" *(1550 mm)* to 85" *(2160 mm)* **Wheel base** 111.5" *(2830 mm)* **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center-line of rear wheels 25.6" *(654 mm)* Vertical distance above roadway 42.0" *(1075 mm)* Horizontal distance from center of rear wheel tread 0" *(0 mm)* to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with partial (3) range operator controlled powershift **Advertised speeds mph *(km/h)*** first 1.7 *(2.7)* second 2.0 *(3.2)* third 2.4 *(3.9)* fourth 3.2 *(5.1)* fifth 3.8 *(6.1)* sixth 4.1 *(6.6)* seventh 4.6 *(7.3)* eighth 4.9 *(7.9)* ninth 5.5 *(8.9)* tenth 5.9 *(9.5)* eleventh 6.7 *(10.8)* twelfth 7.7 *(12.5)* thirteenth 8.0 *(12.9)* fourteenth 9.3 *(15.0)* fifteenth 11.1 *(17.9)* sixteenth 13.6 *(21.9)* seventeenth 16.4 *(26.4)* eighteenth 19.6 *(31.5)* reverse 2.0 *(3.2)*, 2.4 *(3.9)*, 2.9 *(4.7)*, 4.9 *(7.9)*, 6.0 *(9.6)*, 7.1 *(11.5)* **Clutch** single dry disc operated by foot pedal **Brakes** single wet disc hydraulically power actuated by two foot pedals which can be locked together **Steering** hydrostatic **Turning ra-**

LUGGING ABILITY IN 11th (4D) GEAR

Crankshaft Speed rpm	2100	1900	1750	1540	1311	1077
Pull—lbs *(kN)*	5998 *(26.68)*	6795 *(30.23)*	7518 *(33.44)*	8177 *(36.37)*	8276 *(36.81)*	7401 *(32.92)*
Increase in Pull %	0	14	25	36	40	26
Power—Hp *(kW)*	104.69 *(78.07)*	107.15 *(79.91)*	102.85 *(76.70)*	100.35 *(74.83)*	86.56 *(64.60)*	64.19 *(47.87)*
Speed—Mph *(km/h)*	6.62 *(10.66)*	5.95 *(9.57)*	5.27 *(8.48)*	4.60 *(7.41)*	3.91 *(6.30)*	3.23 *(5.19)*
Slip %	2.42	2.59	2.95	3.27	3.44	3.10

TRACTOR SOUND LEVEL WITH CAB	dB(A)
Maximum Available Power—Two Hours	77.0
75% of Pull at Maximum Power—Ten Hours	77.0
50% of Pull at Maximum Power—Two Hours	76.0
50% of Pull at Reduced Engine Speed—Two Hours	74.5
Bystander in 18th (6D) gear	86.5

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi (kPa)	Four 20.8R38; * 12 (83)	Four 20.8R38; * 12 (83)
Ballast	—Liquid (each)	None	None
	—Test equip. (each)	50 lb (23 kg)	None
Front Tires	—No., size, ply & psi (kPa)	Two 11.00-16; 8; 40 (276)	Two 11.00-16; 8; 40 (276)
Ballast	—Liquid (each)	None	None
	—Cast iron (each)	312 lb (142 kg)	None
Height of Drawbar		20.0 in (508 mm)	20.0 in (508 mm)
Static Weight with Operator	—Rear	11510 lb (5221 kg)	11285 lb (5119 kg)
	—Front	3805 lb (1726 kg)	3180 lb (1442 kg)
	—Total	15315 lb (6947 kg)	14465 lb (6561 kg)

THREE POINT HITCH PERFORMANCE
(With external lift cylinder)

Observed Maximum Pressure psi (kPa)	2275	(15690)
Location	remote outlet	
Hydraulic oil temperature °F (°C)	171	(77)
Location	pump inlet	

	Maximum Lift Capacity	
QUICK ATTACH	no	
CATEGORY	III	
LOAD lbs (kg)	*7335	(3327)
TIME sec	2.55	
HITCH POINT MOVEMENT in (mm)		
Lowest position	14.0	(356)
Top of timed range	40.0	(1016)
Highest position	40.1	(1019)
LOAD CG MOVEMENT in (mm)		
Lowest position	13.3	(338)
Top of timed range	44.0	(1118)
Highest position	44.3	(1125)

*Manufacturer's claim was 8000 lb (3629 kg)

dius (on concrete surface with brake applied) right 146" *(3.72 m)* left 146" *(3.72 m)*(on concrete surface without brake) right 190" *(4.84 m)* left 191" *(4.86 m)* **Turning space diameter** (on concrete surface with brake applied) right 305" *(7.75 m)* left 305" *(7.75 m)*(on concrete surface without brake) right 393" *(9.98 m)* left 395" *(10.03 m)* **Power take-off** 540 rpm at 2191 engine rpm and 1000 rpm at 2167 engine rpm **Unladen tractor mass** 12865 lb *(5835 kg)*

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

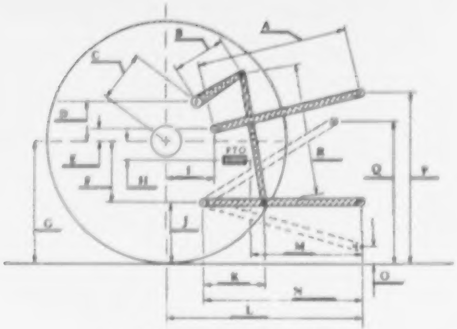
REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test codes and the technically equivalent ISO test codes or official Nebraska test procedure. For the maximum power tests, the fuel temperature at the injection pump return was maintained at 152 °F *(66.7°C)*. Twelve gears were chosen between 15% slip and 10 mph *(16.1 km/h)*.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1613**, February 2, 1989.

Note: report reissued. Supplemental sales permit for White Workhorse 125 Diesel, November, 1991.

LOUIS I. LEVITICUS
Engineer-in-Charge

K. VON BARGEN
R. D. GRISSO
L. L. BASHFORD
Board of Tractor Test Engineers



Hitch Dimensions as Tested — No Load

	inch	mm
A	25.5	648
B	16.0	406
C	20.1	511
D	18.6	472
E	10.4	263
F	10.2	260
G	33.2	844
H	1.9	48
I	19.9	506
J	23.0	584
K	22.3	566
L	45.3	1151
M	22.4	568
N	34.8	884
O	7.1	181
P	45.0	1143
Q	36.1	918
R	40.4	1026

WHITE WORKHORSE 125
THREE POINT HITCH PERFORMANCE
(From Nebraska Tractor Test 1633)
DEUTZ ALLIS 9150 DIESEL

Observed Maximum Pressure psi (kPa)	2275	(15690)
Location	remote outlet	
Hydraulic oil temperature °F (°C)	147	(64)
Location	hydraulic suction line	

	Maximum Lift Capacity		with boost cylinder	
QUICK ATTACH	No		No	
CATEGORY	III		III	
LOAD lbs (kg)	7212	(3271)	8544	(3875)
TIME sec	6.56		4.92	
HITCH POINT MOVEMENT in (mm)				
Lowest position	13.8	(351)	13.6	(345)
Top of timed range	40.0	(1016)	40.0	(1016)
Highest position	40.2	(1021)	40.1	(1019)
LOAD CG MOVEMENT in (mm)				
Lowest position	14.4	(366)	14.2	(361)
Top of timed range	42.1	(1069)	42.1	(1069)
Highest position	42.3	(1074)	42.2	(1072)

White 120 Diesel

Agricultural Research Division
Institute of Agriculture and Natural Resources
University of Nebraska-Lincoln
Darrell Nelson, Dean and Director

NEBRASKA TRACTOR TEST 1616—WHITE 140 DIESEL
ALSO WHITE WORKHORSE 145 DIESEL
18 SPEED

POWER TAKE-OFF PERFORMANCE

Power Hp (kW)	Crank shaft speed rpm	Fuel Consumption gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temperature °F (°C) Cooling medium	Air wet bulb	Air dry bulb	Barometer inch Hg (kPa)
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed — Two hours (PTO Speed — 1016 rpm)								
138.55 (103.30)	2200	8.005 (30.302)	0.399 (0.243)	17.31 (3.409)	186 (85.6)	64 (17.8)	75 (23.9)	28.91 (97.61)
Standard Power Take-off Speed (1000 rpm) — One Hour								
140.30 (104.62)	2166	8.022 (30.361)	0.395 (0.240)	17.49 (3.444)	187 (86.1)	65 (18.3)	75 (23.7)	28.91 (97.62)
VARYING POWER AND FUEL CONSUMPTION — Two Hours								
121.11 (90.31)	2261	7.211 (27.298)	0.411 (0.250)	16.79 (3.308)	186 (85.6)	67 (19.4)	76 (24.2)	
1.59 (1.19)	2335	2.219 (8.398)		0.72 (0.142)	184 (84.4)	67 (19.4)	75 (23.6)	
61.22 (45.65)	2291	4.563 (17.273)	0.515 (0.313)	13.42 (2.643)	184 (84.4)	67 (19.4)	75 (23.6)	
140.36 (104.66)	2201	8.062 (30.519)	0.397 (0.241)	17.41 (3.429)	187 (85.8)	68 (20.0)	76 (24.4)	
50.09 (37.35)	2308	3.578 (13.544)	0.736 (0.448)	9.14 (1.801)	184 (84.2)	68 (20.0)	76 (24.4)	
91.65 (68.35)	2284	5.859 (22.179)	0.440 (0.268)	15.69 (3.091)	178 (81.1)	71 (21.7)	78 (25.6)	
Av 76.47 **Av** (57.03)	2280	5.212 (19.730)	0.484 (0.294)	14.29 (2.815)	184 (84.3)	68 (20.0)	76 (24.3)	28.87 (97.49)

DRAWBAR PERFORMANCE

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank shaft speed rpm	Slip %	Fuel Consumption gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temp. °F (°C) Cooling med	Air wet bulb	Air dry bulb	Barom. inch Hg (kPa)
Maximum Available Power — Two Hours 12th (4D) Gear											
122.85 (91.61)	7458 (33.17)	6.18 (9.94)	2199	2.70	7.081 (26.802)	0.449 (0.273)	15.59 (3.072)	182 (83.3)	64 (17.8)	70 (20.8)	28.66 (96.78)
75% of Pull at Maximum Power — Ten Hours 12th (4D) Gear											
97.71 (72.86)	5698 (25.34)	6.43 (10.35)	2276	2.05	6.705 (25.379)	0.474 (0.288)	14.58 (2.871)	182 (83.3)	54 (12.3)	66 (19.0)	28.96 (97.80)
50% of Pull at Maximum Power — Two Hours 12th (4D) Gear											
66.09 (49.28)	3797 (16.89)	6.53 (10.50)	2297	1.45	5.239 (19.831)	0.548 (0.333)	12.62 (2.485)	176 (79.7)	60 (15.6)	64 (17.8)	28.71 (96.95)
50% of Pull at Reduced Engine Speed — Two Hours 15th (5O) Gear											
66.09 (49.28)	3797 (16.89)	6.53 (10.50)	1619	1.45	4.465 (16.902)	0.467 (0.284)	14.80 (2.916)	174 (78.9)	62 (16.7)	67 (19.2)	28.96 (97.79)

MAXIMUM POWER IN SELECTED GEARS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank shaft speed rpm	Slip %	Gear	Cooling med	Air wet bulb	Air dry bulb	Barom. inch Hg (kPa)
107.45 (80.13)	15060 (66.99)	2.68 (4.31)	2242	11.05	5th (2D) Gear	185 (85.0)	70 (21.1)	76 (24.4)	28.60 (96.58)
118.93 (88.69)	13576 (60.39)	3.29 (5.29)	2199	6.56	6th (2O) Gear	186 (85.3)	69 (20.6)	75 (23.9)	28.60 (96.58)
121.48 (90.59)	11915 (53.00)	3.82 (6.15)	2198	4.81	7th (3U) Gear	184 (84.2)	69 (20.6)	75 (23.9)	28.61 (96.61)
124.81 (93.07)	9992 (44.45)	4.68 (7.54)	2199	3.66	8th (3D) Gear	186 (85.6)	68 (20.0)	75 (23.9)	28.61 (96.61)
123.68 (92.23)	9155 (40.73)	5.08 (8.17)	2200	3.16	9th (4U) Gear	183 (83.9)	68 (20.0)	74 (23.3)	28.62 (96.65)
119.90 (89.41)	7969 (35.45)	5.64 (9.08)	2200	2.91	10th (3O) Gear	185 (85.0)	67 (19.4)	74 (23.3)	28.62 (96.65)
122.45 (91.31)	7567 (33.66)	6.07 (9.77)	2202	2.74	11th (5U) Gear	183 (83.9)	66 (18.9)	73 (22.8)	28.65 (96.68)
125.01 (93.22)	7594 (33.78)	6.17 (9.94)	2198	2.66	12th (4D) Gear	190 (87.8)	67 (19.4)	74 (23.3)	28.62 (96.65)
123.64 (92.35)	6304 (28.04)	7.37 (11.86)	2200	2.52	13th (5D) Gear	182 (83.3)	66 (18.9)	73 (22.8)	28.65 (96.68)
119.60 (89.18)	6055 (26.93)	7.41 (11.93)	2198	2.14	14th (4O) Gear	188 (86.4)	66 (18.9)	72 (22.2)	28.64 (96.71)
119.08 (88.80)	5058 (22.50)	8.83 (14.21)	2200	1.89	15th (5O) Gear	187 (86.1)	66 (18.9)	73 (22.8)	28.65 (96.68)

Department of Agricultural Engineering

Dates of Test: September 20 to October 5, 1988

Manufacturer: WHITE-NEW IDEA FARM EQUIPMENT COMPANY, Division of Allied Products, 123 West Sycamore Street, Coldwater, Ohio 45828

FUEL, OIL AND TIME: **Fuel** No. 2 Diesel **Cetane No.** 51.2 (rating taken from oil company's inspection data) **Specific gravity converted to 60/60°F** *(15/15°C)* 0.8299 **Fuel weight** 6.910 lbs/gal *(0.828 kg/l)* **Oil SAE** 15W-40 **API service classification** CC, CD/SD, SE, SF **To motor** 3.741 gal *(14.162 l)* **Drained from motor** 3.231 gal *(12.231 l)* **Transmission and final drive lubricant** White Farm Equipment Universal Fluid **Total time engine was operated** 55.5 hours

ENGINE: **Make** Consolidated Diesel Corporation-Cummins Diesel **Type** six cylinder vertical with turbocharger and intercooler **Serial No.** 44220402 **Crankshaft** lengthwise **Rated rpm** 2200 **Bore and stroke** 4.02" × 4.72" *(102 mm × 120 mm)* **Compression ratio** 16.5 to 1 **Displacement** 359 cu in *(5880 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements and aspirator **Oil filter** one full flow cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, separate radiators for transmission and powershift oils **Fuel filter** one paper cartridge and prestrainer **Muffler** underhood **Exhaust** vertical **Cooling medium temperature control** one thermostat

ENGINE OPERATING PARAMETERS: **Maximum fuel rate** 59.04 lb/hr *(26.78 kg/hr)* **High idle** 2325-2425 rpm **Turbo boost** nominal 13.2-16.2 psi *(91-112 kPa)* as measured 15.0 psi *(103 kPa)*

CHASSIS: **Type** standard with duals **Serial No.** *401159-1401* **Tread width** rear 64" *(1625 mm)* to 123" *(3125 mm)* front 60" *(1524 mm)* to 84" *(2135 mm)* **Wheel base** 111.5" *(2830 mm)* **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center line of rear wheels 25.1" *(639 mm)* Vertical distance above roadway 43.2" *(1096 mm)* Horizontal distance from center of rear wheel tread 0" *(0 mm)* to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with partial (3) range operator controlled powershift **Advertised speeds mph (km/h)** first 1.8 *(3.0)* second 2.2 *(3.6)* third 2.4 *(3.9)* fourth 2.7 *(4.3)* fifth 2.9 *(4.7)* sixth 3.5 *(5.6)* seventh 4.0 *(6.4)* eighth 4.8 *(7.7)* ninth 5.2 *(8.4)* tenth 5.7 *(9.2)* eleventh 6.2 *(9.9)* twelfth 6.3 *(10.1)* thirteenth 7.5 *(12.0)* fourteenth 7.5 *(12.1)* fifteenth 8.9 *(14.3)* sixteenth 13.2 *(21.3)* seventeenth 16.0 *(25.8)* eighteenth 19.1 *(30.8)* reverse 2.2 *(3.5)*, 2.6 *(4.2)*, 3.1 *(5.0)*, 4.6 *(7.4)*, 5.6 *(9.0)*, 6.7 *(10.8)* **Clutch** single dry disc operated by foot pedal **Brakes** single wet disc hydraulically power actuated by two foot pedals which can be locked together **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 151" *(3.83 m)* left 155" *(3.88 m)* (on concrete surface without brake) right 226" *(5.75 m)* left 248" *(6.29 m)* **Turning space diameter** (on concrete surface with brake applied) right 310" *(7.87 m)* left 320" *(8.12 m)* (on concrete surface without brake) right 484" *(12.28 m)* left 522" *(13.27 m)* **Power take-off** 540 rpm at 2191 engine rpm and 1000 rpm at 2167 engine rpm **Unladen tractor mass** 15065 lb *(6834 kg)*

LUGGING ABILITY IN 12th (4D) GEAR

Crankshaft Speed rpm	2198	1988	1748	1528	1318	1105
Pull—lbs *(kN)*	7594 *(33.78)*	8358 *(37.18)*	9180 *(40.70)*	9632 *(42.85)*	5571 *(24.78)*	5086 *(22.62)*
Increase in Pull %	0	10	21	27	-27	-33
Power—Hp *(kW)*	125.01 *(93.22)*	124.05 *(92.51)*	119.42 *(89.05)*	109.54 *(81.69)*	54.55 *(40.67)*	42.42 *(31.64)*
Speed—Mph *(km/h)*	6.17 *(9.94)*	5.57 *(8.96)*	4.88 *(7.86)*	4.26 *(6.86)*	3.67 *(5.91)*	3.13 *(5.04)*
Slip %	2.66	2.99	3.16	3.50	1.97	1.57

TRACTOR SOUND LEVEL WITH CAB	dB(A)
Maximum Available Power—Two Hours	75.5
75% of Pull at Maximum Power—Ten Hours	75.5
50% of Pull at Maximum Power—Two Hours	74.5
50% of Pull at Reduced Engine Speed—Two Hours	74.5
Bystander in 17th (6D) gear	86.5

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi *(kPa)*	Four 20.8R38; *; 12 *(83)*	Four 20.8R38; *; 12 *(83)*
Ballast	—Liquid (each)	None	None
	—Test equip. (each)	31 lb *(14 kg)*	None
Front Tires	—No., size, ply & psi *(kPa)*	Two 11.00-16; 8; 40 *(276)*	Two 11.00-16; 8; 40 *(276)*
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	438 lb *(199 kg)*	None
Height of Drawbar		24 in *(610 mm)*	24 in *(610 mm)*
Static Weight with Operator	—Rear	11565 lb *(5246 kg)*	11090 lb *(5030 kg)*
	—Front	4100 lb *(1860 kg)*	[illegible]
	—Total	15665 lb *(7106 kg)*	[illegible]

THREE POINT HITCH PERFORMANCE
(With external lift cylinder)

Observed Maximum Pressure psi *(kPa)*	2275	*(15690)*
Location	remote outlet	
Hydraulic oil temperature °F *(°C)*	158	*(70)*
Location	pump inlet	

	Maximum Lift Capacity	
QUICK ATTACH	no	
CATEGORY	III	
LOAD lbs *(kg)*	*7110	*(3162)*
TIME sec	0.95	
HITCH POINT MOVEMENT in *(mm)*		
Lowest position	12.0	*(304)*
Top of rated range	38.0	*(965)*
Highest position	**38.4	*(975)*
LOAD CG MOVEMENT in *(mm)*		
Lowest position	11.4	*(290)*
Top of rated range	40.7	*(1034)*
Highest position	41.6	*(1057)*

*Manufacturer's claim was 8000 lb *(3629 kg)*.
**The observed highest position 38.4" *(975 mm)* does not meet the minimum top height 40.0" *(1016 mm)* specified by ASAE standard S217.10.

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

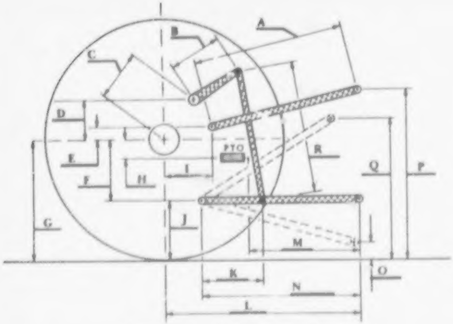
REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test codes and the technically equivalent ISO test codes or official Nebraska test procedure. For the maximum power tests, the fuel temperature at the injection pump return was maintained at 144 °F *(62.4°C)*. Eleven gears were chosen between 15% slip and 10 mph *(16.1 km/h)*. Manufacturer specifications for engine bore, stroke, displacement and compression ratio were not verified.

We, the undersigned, certify that this is as true and correct report of official Tractor Test No. **1616**, February 2, 1989.

Note: Report reissued, supplemental sales permit for White Workhorse 145 Diesel November, 1991.

LOUIS I. LEVITICUS
Engineer-in-charge

K. VON BARGEN
R. D. GRISSO
L. L. BASHFORD
Board of Tractor Test Engineers



Hitch Dimensions as Tested — No Load

	inch	mm
A	25.5	*641*
B	16.0	*406*
C	20.1	*511*
D	18.5	*472*
E	10.4	*263*
F	10.2	*260*
G	33.2	*844*
H	1.5	*48*
I	19.9	*506*
J	23.0	*584*
K	22.3	*566*
L	45.3	*1151*
M	22.4	*568*
N	34.8	*884*
O	7.4	*187*
P	45.0	*1143*
Q	37.1	*943*
R	39.8	*1010*

WHITE WORKHORSE 145 DIESEL
THREE POINT HITCH PERFORMANCE
(From Nebraska Tractor Test 1633)
DEUTZ ALLIS 9150 DIESEL

Observed Maximum Pressure psi *(kPa)*	2275 *(15686)*	
Location	remote outlet	
Hydraulic oil temperature °F *(°C)*	147 *(64)*	
Location	hydraulic suction line	
	Maximum Lift Capacity	**with boost cylinder**
QUICK ATTACH	No	No
CATEGORY	III	III
LOAD lbs *(kg)*	7212 *(3271)*	8544 *(3875)*
TIME sec	6.36	4.92
HITCH POINT MOVEMENT in *(mm)*		
Lowest position	13.8 *(351)*	13.6 *(345)*
Top of tuned range	40.0 *(1016)*	40.0 *(1016)*
Highest position	40.2 *(1021)*	40.1 *(1019)*
LOAD CG MOVEMENT in *(mm)*		
Lowest position	14.4 *(366)*	14.2 *(361)*
Top of tuned range	42.1 *(1069)*	42.1 *(1069)*
Highest position	42.3 *(1074)*	42.2 *(1072)*

White 140 Diesel

Agricultural Research Division
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Darrell Nelson, Dean and Director

NEBRASKA TRACTOR TEST 1640—BELARUS 822 DIESEL
ALSO BELARUS 820 DIESEL
ALSO BELARUS 800M AND 802M DIESEL
18 SPEED

POWER TAKE-OFF PERFORMANCE

Power Hp *(kW)*	Crank shaft speed rpm	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temperature °F (°C) Cooling medium	Air wet bulb	Air dry bulb	Barometer inch Hg *(kPa)*
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed — Two hours (PTO Speed — 571 rpm)								
75.15 *(56.04)*	2200	4.477 *(16.948)*	0.417 *(0.253)*	16.78 *(3.31)*	195 *(91)*	59 *(15)*	75 *(24)*	28.85 *(97.70)*
Standard Power Take-Off Speed (1001 rpm) — One Hour								
73.55 *(54.85)*	2183	4.433 *(16.780)*	0.421 *(0.256)*	16.59 *(3.27)*	194 *(90)*	63 *(17)*	74 *(23)*	28.78 *(97.46)*
Standard Power Take-Off Speed (540 rpm) — One Hour								
71.71 *(53.47)*	2075	4.221 *(15.979)*	0.412 *(0.250)*	16.99 *(3.35)*	196 *(91)*	59 *(15)*	75 *(24)*	28.80 *(97.53)*
VARYING POWER AND FUEL CONSUMPTION — Two Hours								
64.73 *(48.27)*	2228	3.875 *(14.668)*	0.418 *(0.255)*	16.71 *(3.29)*	184 *(84)*	59 *(15)*	75 *(24)*	
—	2331	1.330 *(5.016)*	—	—	144 *(62)*	59 *(15)*	75 *(24)*	
33.40 *(24.91)*	2302	2.300 *(8.707)*	0.481 *(0.293)*	14.52 *(2.86)*	155 *(68)*	60 *(16)*	75 *(24)*	
74.22 *(55.34)*	2205	4.407 *(16.681)*	0.415 *(0.253)*	16.84 *(3.32)*	187 *(86)*	61 *(16)*	76 *(24)*	
16.85 *(12.57)*	2320	1.824 *(6.904)*	0.757 *(0.460)*	9.24 *(1.82)*	154 *(68)*	61 *(16)*	76 *(24)*	
49.55 *(36.95)*	2268	3.025 *(11.452)*	0.429 *(0.261)*	16.31 *(3.21)*	167 *(75)*	63 *(17)*	76 *(24)*	
Av **39.88** Av *(29.73)*	**2273**	**2.794** *(10.577)*	**0.490** *(0.298)*	**14.27** *(2.81)*	**165** *(74)*	**60** *(16)*	**75** *(24)*	**28.81** *(97.56)*

DRAWBAR PERFORMANCE
(Front Drive in Automatic mode)

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temp °F (°C) Cool-ing med	Air wet bulb	Air dry bulb	Barom inch Hg *(kPa)*
Maximum Available Power — Two Hours 9th (4H) Gear											
62.47 *(46.58)*	4229 *(18.81)*	5.54 *(8.92)*	2200	5.47	4.298 *(16.271)*	0.481 *(0.293)*	14.53 *(2.86)*	190 *(88)*	68 *(20)*	79 *(26)*	28.87 *(97.75)*
75% of Pull at Maximum Power — Ten Hours 9th (4H) Gear											
49.53 *(36.93)*	3263 *(14.51)*	5.69 *(9.16)*	2244	2.73	3.545 *(13.412)*	0.500 *(0.304)*	13.98 *(2.75)*	185 *(85)*	74 *(23)*	86 *(30)*	28.79 *(97.50)*
50% of Pull at Maximum Power — Two Hours 9th (4H) Gear											
34.10 *(25.43)*	2175 *(9.67)*	5.88 *(9.46)*	2301	2.09	2.775 *(10.505)*	0.569 *(0.346)*	12.29 *(2.42)*	171 *(77)*	73 *(23)*	85 *(29)*	28.65 *(97.01)*
50% of Pull at Reduced Engine Speed — Two Hours 14th (8L) Gear											
34.10 *(25.42)*	2175 *(9.67)*	5.88 *(9.46)*	1509	2.07	2.310 *(8.745)*	0.474 *(0.288)*	14.76 *(2.91)*	185 *(84)*	74 *(23)*	85 *(29)*	28.62 *(96.90)*

Department of Biological Systems Engineering

Dates of Test: June 6-19, 1990

Sound level test on 800M—October 25, 1991

Manufacturer: MINSK TRACTOR WORKS, MTZ, Minsk, USSR

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 53.9 (rating taken from oil company's inspection data) **Specific gravity converted to 60/60°F** *(15/15°C)* 0.8396 **Fuel weight** 6.991 lbs/gal *(0.838 kg/l)* **Oil SAE** 30 **API service classification** SE, SF, CC, CD **To motor** 2.575 gal *(9.748 l)* **Drained from motor** 2.332 gal *(8.828 l)* **Transmission and final drive lubricant** SAE 90 gear lubricant **Hydraulic lubricant** SAE 30 **Total time engine was operated** 39.0 hours

ENGINE: Make MTZ Diesel **Model** D240 **Type** four cylinder vertical **Serial No.** 214336 **Crankshaft** lengthwise **Rated rpm** 2200 **Bore and stroke** (as specified) 4.331" × 4.921" *(110 mm × 125 mm)* **Compression ratio** 16 to 1 **Displacement** 290 cu in *(4750 ml)* **Starting system** 24 volt **Lubrication** pressure **Air cleaner** oil bath with pre-cleaner **Oil filter** full flow centrifugal **Oil cooler** radiator for crankcase oil **Fuel filter** one cleanable screen and one paper element **Muffler** vertical **Cooling medium temperature control** one thermostat

ENGINE OPERATING PARAMETERS: Fuel rate: not to exceed 32.4 lb/h *(14.7 kg/h)* **High idle:** not to exceed 2380 rpm

CHASSIS: Type front wheel assist **Serial No.** 295433 **Tread width** rear 56.7" *(1440 mm)* to 82.7" *(2100 mm)* front 53.1" *(1350 mm)* to 70.9" *(1800 mm)* **Wheel base** 96.5" *(2450 mm)* **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from centerline of rear wheels 36.9" *(937 mm)* Vertical distance above roadway 40.4" *(1025 mm)* Horizontal distance from center of rear wheel tread 0.4" *(11 mm)* to the right **Hydraulic control system** direct engine drive with throwout lever (engaged during test) **Transmission** selective gear fixed ratio **Advertised speeds mph (km/h)** first 1.2 *(1.9)* second 1.6 *(2.6)* third 2.1 *(3.3)* fourth 2.7 *(4.4)* fifth 3.5 *(5.6)* sixth 4.3 *(6.9)* seventh 4.6 *(7.4)* eighth 5.1 *(8.2)* ninth 5.7 *(9.1)* tenth 6.0 *(9.6)* eleventh 6.7 *(10.8)* twelfth 7.3 *(11.8)* thirteenth 7.9 *(12.7)* fourteenth 8.7 *(13.9)* fifteenth 9.7 *(15.6)* sixteenth 11.5 *(18.4)* seventeenth 16.1 *(25.9)* eighteenth 21.3 *(34.3)* reverse 2.5 *(4.1)*, 3.4 *(5.4)*, 4.3 *(7.0)*, 5.7 *(9.2)* **Clutch** single dry disc operated by foot pedal **Brakes** dry disc operated by two foot pedals which can be locked together **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right

MAXIMUM POWER IN SELECTED GEARS

47.90 *(35.72)*	9975 *(44.36)*	1.80 *(2.90)*	2241	14.50	3rd (2L) Gear	183 *(84)*	72 *(22)*	80 *(27)*	28.66 *(97.05)*
59.20 *(44.15)*	8906 *(39.61)*	2.49 *(4.01)*	2200	8.56	4th (2H) Gear	185 *(85)*	72 *(22)*	82 *(28)*	28.64 *(96.99)*
62.58 *(46.51)*	7021 *(31.23)*	3.33 *(5.36)*	2200	5.63	5th (3L) Gear	185 *(85)*	67 *(19)*	73 *(23)*	28.84 *(97.66)*
63.37 *(47.26)*	5741 *(25.53)*	4.14 *(6.66)*	2198	4.58	6th (4L) Gear	185 *(85)*	67 *(19)*	73 *(23)*	28.84 *(97.66)*
63.33 *(47.23)*	5305 *(23.60)*	4.48 *(7.20)*	2199	4.15	7th (3H) Gear	184 *(84)*	67 *(19)*	72 *(22)*	28.83 *(97.63)*
63.55 *(47.39)*	4825 *(21.46)*	4.94 *(7.95)*	2199	5.72	8th (5L) Gear	187 *(86)*	66 *(19)*	74 *(23)*	28.85 *(97.70)*
64.27 *(47.93)*	4350 *(19.35)*	5.54 *(8.92)*	2201	5.36	9th (4H) Gear	188 *(86)*	66 *(19)*	76 *(24)*	28.87 *(97.77)*
63.41 *(47.28)*	4099 *(18.21)*	5.81 *(9.35)*	2197	5.29	10th (6L) Gear	187 *(86)*	66 *(19)*	75 *(24)*	28.86 *(97.73)*
63.95 *(47.69)*	3640 *(16.19)*	6.59 *(10.60)*	2199	5.07	11th (5H) Gear	186 *(86)*	66 *(19)*	74 *(23)*	28.85 *(97.70)*
63.10 *(47.06)*	3291 *(14.64)*	7.19 *(11.57)*	2201	2.77	12th (7L) Gear	183 *(84)*	67 *(19)*	72 *(22)*	28.83 *(97.63)*
63.52 *(47.36)*	3079 *(13.69)*	7.74 *(12.46)*	2199	2.55	13th (6H) Gear	186 *(85)*	66 *(19)*	75 *(24)*	28.86 *(97.73)*
62.19 *(46.38)*	2731 *(12.15)*	8.54 *(13.74)*	2200	2.33	14th (8L) Gear	181 *(83)*	67 *(19)*	71 *(22)*	28.82 *(97.60)*

LUGGING ABILITY IN 9th (4H) GEAR

Crankshaft Speed rpm	2201	1980	1755	1535	1318	1101
Pull—lbs *(kN)*	4350 *(19.35)*	4580 *(20.37)*	4997 *(22.23)*	5344 *(23.77)*	5353 *(23.81)*	5095 *(22.66)*
Increase in Pull %	0	5	15	23	23	17
Power—Hp *(kW)*	64.27 *(47.93)*	60.74 *(45.30)*	58.49 *(43.62)*	54.58 *(40.70)*	46.98 *(35.03)*	37.44 *(27.92)*
Speed—Mph *(km/h)*	5.54 *(8.92)*	4.97 *(8.00)*	4.39 *(7.06)*	3.83 *(6.16)*	3.29 *(5.30)*	2.76 *(4.45)*
Slip %	5.36	5.58	5.87	6.15	6.30	6.15

TRACTOR SOUND LEVEL	W/O Cab dB(A)	With Cab dB(A)
Maximum Available Power—Two Hours	94.0	81.5
75% of Pull at Maximum Power—Ten Hours	93.0	80.5
50% of Pull at Maximum Power—Two Hours	92.0	81.0
50% of Power at Reduced Engine Speed—Two Hours	91.0	80.5
Bystander in 17th (9H) gear	86.0	89.0

MAXIMUM POWER IN SELECTED GEARS
MAXIMUM POWER (4WD MODE)

64.16 *(47.85)*	4346 *(19.33)*	5.54 *(8.91)*	2199	2.86	9th (4H) Gear	188 *(86)*	66 *(19)*	76 *(24)*	28.87 *(97.77)*

MAXIMUM PULL (2WD MODE) —

51.16 *(38.15)*	8053 *(35.82)*	2.38 *(3.83)*	2234	14.49	4th (2H) Gear	180 *(82)*	72 *(22)*	81 *(27)*	28.65 *(97.02)*

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi *(kPa)*	Two 400/965/15.5-38P; 8; 24 *(165)*	Two 400/965/15.5-38P; 8; 24 *(165)*
Ballast	—Liquid (each)	280 lb *(127 kg)*	None
	—Cast Iron (each)	150 lb *(68 kg)*	None
Front Tires	—No., size, ply & psi *(kPa)*	Two 290/508/11.2-20; 8; 20 *(140)*	Two 290/508/11.2-20; 8; 20 *(140)*
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	15 lb *(7 kg)*	None
Height of Drawbar		15.5 in *(394 mm)*	15.5 in *(394 mm)*
Static Weight with Operator	—Rear	7620 lb *(3456 kg)*	5880 lb *(2667 kg)*
	—Front	3455 lb *(1567 kg)*	3430 lb *(1556 kg)*
	—Total	11075 lb *(5023 kg)*	9310 lb *(4223 kg)**

156" *(3.96 m)* left 191" *(4.85 m)*(on concrete surface without brake) right 175" *(4.45 m)* left 215" *(5.46 m)* **Turning space diameter** (on concrete surface with brake applied) right 323" *(8.20 m)* left 393" *(9.98 m)*(on concrete surface without brake) right 361" *(9.17 m)* left 441" *(11.20 m)* **Power take-off** 540 rpm at 2075 engine rpm and 1000 rpm at 2182 engine rpm **Unladen tractor mass** 8480 lb *(3846 kg)*

REPAIRS AND ADJUSTMENTS: One fuel injector was replaced during preliminary PTO test.

***NOTE:** Tractor is shipped with rear weights — 168 lb *(76 kg)* and front weight package — 492 lb *(223 kg)*.

Note: Report reissued, supplemental sales permit for Belarus 800M and 802M Diesel models. December, 1991

REMARKS: All test results were determined from observed data obtained in accordance with official SAE and Nebraska test procedures. For the maximum power tests, the fuel temperature at the injection pump was maintained at 164 °F *(73°C)*. Twelve gears were chosen between 15% slip and 10 mph *(16.1 km/h)*.

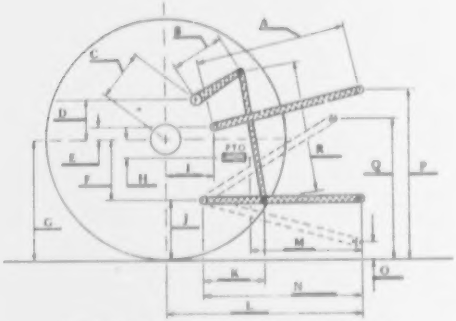
We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1640**, July, 30, 1990.

LOUIS I. LEVITICUS
Engineer-in-Charge

K. VON BARGEN
R. D. GRISSO
L. L. BASHFORD
Board of Tractor Test Engineers

THREE POINT HITCH PERFORMANCE

Observed Maximum Pressure psi *(kPa)*	2800	*(19300)*
Location	remote outlet	
Hydraulic oil temperature °F *(°C)*	151	*(66)*
Location	hydraulic reservoir	
	Maximum Lift Capacity	
QUICK ATTACH	No	
CATEGORY	II	
LOAD lbs *(kg)*	3324	*(1508)*
TIME sec	2.14	
HITCH POINT MOVEMENT in *(mm)*		
Lowest position	12.0	*(305)*
Top of timed range	36.0	*(914)*
Highest position	36.5	*(927)*
LOAD CG MOVEMENT in *(mm)*		
Lowest position	12.2	*(309)*
Top of timed range	43.3	*(1099)*
Highest position	44.8	*(1137)*



HITCH DIMENSIONS AS TESTED—NO LOAD

	inch	mm
A	21.0	*533*
B	10.2	*260*
C	17.6	*447*
D	10.6	*270*
E	6.3	*160*
F	9.6	*245*
G	28.4	*721*
H	4.6	*117*
I	19.0	*483*
J	18.8	*478*
K	15.1	*384*
L	40.0	*1016*
M	22.6	*573*
N	31.1	*791*
O	8.0	*203*
P	37.8	*961*
Q	36.4	*924*
R	18.4	*467*

Belarus 822 Diesel

Agricultural Research Division
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Darrell W. Nelson, Dean and Director

NEBRASKA OECD TRACTOR TEST 1620—SUMMARY 058
JOHN DEERE 4555 POWERSHIFT DIESEL
ALSO JOHN DEERE 4560 POWERSHIFT DIESEL
15 SPEED

POWER TAKE-OFF PERFORMANCE

Power HP (kW)	Crank shaft speed rpm	Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Mean Atmospheric Conditions
MAXIMUM POWER AND FUEL CONSUMPTION					
Rated Engine Speed—(PTO speed—998 rpm)					
156.89 (116.99)	2200	8.94 (33.83)	0.394 (0.240)	17.55 (3.46)	
Maximum Power (2 Hours)					
162.47 (121.15)	1900	8.72 (32.99)	0.371 (0.226)	18.64 (3.67)	Air temperature
VARYING POWER AND FUEL CONSUMPTION					
156.89 (116.99)	2200	8.94 (33.83)	0.394 (0.240)	17.55 (3.46)	77°F (25°C)
135.63 (101.14)	2242	7.99 (30.23)	0.407 (0.248)	16.98 (3.35)	Relative humidity
103.69 (77.32)	2276	6.60 (24.97)	0.440 (0.268)	15.72 (3.10)	53%
70.56 (52.61)	2325	5.25 (19.88)	0.514 (0.313)	13.43 (2.65)	Barometer
35.55 (26.51)	2358	3.82 (14.46)	0.741 (0.451)	9.31 (1.83)	29.10" Hg (98.54 kPa)
0.77 (0.58)	2389	2.43 (9.20)	21.706 (13.203)	0.32 (0.06)	

Maximum Torque 496 lb.-ft. (672 Nm) at 1600 rpm
Maximum Torque Rise 32.6%
Torque Rise at 1000 engine rpm 21%

DRAWBAR PERFORMANCE
FUEL CONSUMPTION CHARACTERISTICS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp °F (°C) cool ing med	Temp °F (°C) Air dry bulb	Barom. inch Hg (kPa)
Maximum Power—12th Gear									
131.40 (97.99)	5811 (25.85)	8.48 (13.65)	2199	2.26	0.470 (0.286)	14.70 (2.90)	184 (84)	72 (22)	28.82 (97.60)
75% of Pull at Maximum Power—12th Gear									
101.78 (75.90)	4357 (19.38)	8.76 (14.10)	2257	1.64	0.504 (0.307)	13.70 (2.70)	184 (84)	76 (24)	28.81 (97.56)
50% of Pull at Maximum Power—12th Gear									
69.64 (51.93)	2906 (12.93)	8.99 (14.46)	2301	1.02	0.600 (0.365)	11.53 (2.27)	180 (82)	76 (24)	28.81 (97.56)
75% of Pull at Reduced Engine Speed—15th Gear									
101.57 (75.74)	4354 (19.37)	8.75 (14.08)	1822	1.61	0.408 (0.248)	[illegible]	185 (85)	76 (24)	28.81 (97.56)
50% of Pull at Reduced Engine Speed—15th Gear									
69.85 (52.08)	2916 (12.97)	8.98 (14.46)	1858	1.02	0.530 (0.322)	13.05 (2.57)	181 (83)	76 (24)	28.81 (97.56)

Location of Test: Center for Agricultural Equipment, Lincoln Nebraska 68583-0832, U.S.A.

Dates of Test: April-May, 1989

Manufacturer: John Deere Waterloo Works, P.O. Box 3500, Waterloo, Iowa 50704

FUEL OIL and TIME: Fuel No. 2 Diesel **Cetane No.** 51.1 **Specific gravity converted to 60°/60°F** *(15°/15°C)* 0.8301 **Fuel weight** 6.912 lbs/gal *(0.828 kg/l)* **Oil SAE** 15W40 **API service classification** CD/SD **To motor** 5.433 gal *(20.564 l)* **Drained from motor** 5.233 gal *(19.809 l)* **Transmission and hydraulic lubricant** John Deere HyGard fluid **Front axle lubricant** John Deere GL-5 Gear Lubricant 85W-140 **Total time engine was operated** 29.5 hours

ENGINE: Make John Deere Diesel **Type** six cylinder vertical with turbocharger **Serial No.** *RG6076T102916* **Crankshaft** lengthwise **Rated engine speed** 2200 **Bore and stroke** (as specified) 4.56" × 4.75" *(115.8 mm × 120.7 mm)* **Compression ratio** 16.0 to 1 **Displacement** 466 cu in *(7634 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements **Oil filter** one full flow cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** one paper cartridge and prefilter **Muffler** vertical **Cooling medium temperature control** 2 thermostats and variable speed fan

ENGINE OPERATING PARAMETERS: Fuel rate 59.9-65.4 lb/hr *(27.2-29.7 kg/hr)* **High idle** 2350-2400 rpm **Turbo boost** nominal 15-18 psi *(103-124 kPa)* as measured 16.5 psi *(114 kPa)*

CHASSIS: Type front wheel assist **Serial No.** *RW4555P001019* **Tread width** rear 62.0" *(1574 mm)* to 115.7" *(2938 mm)* front 63.1" *(1603 mm)* to 85.3" *(2166 mm)* **Wheel base** 117.1" *(2974 mm)* **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with full range operator controlled powershift **Nominal travel speeds mph** *(km/h)* first 1.38 *(2.22)* second 1.97 *(3.18)* third 2.38 *(3.84)* fourth 3.00 *(4.82)* fifth 3.45 *(5.55)* sixth 3.92 *(6.30)* seventh 4.51 *(7.26)* eighth 5.18 *(8.34)* ninth 5.97 *(9.61)* tenth 6.78 *(10.91)* eleventh 7.81 *(12.57)* twelfth 8.74 *(14.06)* thirteenth 10.81 *(17.40)* fourteenth 15.12 *(24.34)* fifteenth 18.71 *(30.11)* reverse 1.91 *(3.07)*, 2.73 *(4.40)*, 4.15 *(6.67)*, 6.25 *(10.06)* **Clutch** multiple wet disc hydraulically power actuated by foot pedal **Brakes** multiple wet disc hydraulically power actuated by two foot pedals which can be locked together **Steering** hydrostatic **Power take-off** 998 rpm at 2200 engine rpm **Unladen tractor mass** 17755 lb *(8053 kg)*

DRAWBAR PERFORMANCE AT 1900 RPM
MAXIMUM POWER IN SELECTED GEARS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp °F (°C) cool ing med	Temp °F (°C) Air dry bulb	Barom. inch Hg (kPa)
5th Gear									
120.54 (89.89)	15595 (69.37)	2.89 (4.66)	2160	15.92	0.515 (0.313)	13.48 (2.65)	185 (85)	58 (14)	28.65 (96.97)
6th Gear									
128.09 (95.52)	14051 (62.50)	3.42 (5.50)	2140	9.59	0.482 (0.293)	14.34 (2.83)	185 (85)	60 (16)	28.65 (96.97)
7th Gear									
132.62 (98.89)	12792 (56.90)	3.89 (6.26)	2049	6.82	0.464 (0.282)	14.88 (2.93)	185 (85)	57 (14)	28.83 (97.63)
8th Gear									
130.94 (97.64)	11786 (52.43)	4.17 (6.71)	1900	6.11	0.462 (0.281)	14.96 (2.95)	184 (84)	64 (18)	28.54 (96.65)
9th Gear									
134.05 (99.96)	10275 (45.69)	4.89 (7.87)	1901	4.72	0.451 (0.274)	15.32 (3.02)	185 (85)	59 (15)	28.83 (97.63)
10th Gear									
134.04 (99.96)	9008 (40.07)	5.58 (8.98)	1902	4.05	0.451 (0.274)	15.33 (3.02)	186 (85)	66 (19)	28.64 (96.99)
11th Gear									
133.06 (99.22)	7687 (34.19)	6.49 (10.45)	1902	3.12	0.453 (0.276)	15.25 (3.00)	186 (86)	67 (19)	28.82 (97.60)
12th Gear									
138.45 (103.24)	7124 (31.69)	7.29 (11.73)	1902	2.86	0.434 (0.264)	15.94 (3.14)	186 (85)	70 (21)	28.82 (97.60)
15th Gear									
135.47 (101.02)	5592 (24.87)	9.09 (14.62)	1903	2.26	0.446 (0.271)	15.49 (3.05)	186 (86)	71 (22)	28.82 (97.60)

DRAWBAR PERFORMANCE AT 1900 RPM
MAXIMUM POWER IN SELECTED GEARS—BALLASTED TRACTOR

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp °F (°C) cool ing med	Temp °F (°C) Air dry bulb	Barom. inch Hg (kPa)
3rd Gear									
115.78 (86.34)	20873 (92.85)	2.04 (3.29)	2233	14.85	0.525 (0.319)	13.18 (2.60)	184 (84)	50 (10)	29.01 (98.24)
4th Gear									
131.11 (97.77)	18729 (83.31)	2.63 (4.24)	2126	8.58	0.472 (0.287)	14.66 (2.89)	181 (83)	50 (10)	29.07 (98.44)
5th Gear									
132.87 (99.08)	17978 (79.97)	2.76 (4.45)	1920	7.85	0.461 (0.281)	14.98 (2.95)	181 (83)	53 (12)	29.16 (98.75)
6th Gear									
137.51 (102.54)	16101 (71.62)	3.18 (5.12)	1899	6.19	0.443 (0.270)	15.60 (3.07)	185 (85)	54 (12)	29.00 (98.21)
7th Gear									
140.10 (104.48)	13820 (61.47)	3.80 (6.12)	1901	4.87	0.436 (0.265)	15.86 (3.12)	185 (85)	53 (12)	29.11 (98.58)
8th Gear									
134.95 (100.63)	11840 (52.66)	4.27 (6.88)	1903	3.81	0.453 (0.276)	15.25 (3.00)	185 (85)	56 (13)	29.04 (98.35)
9th Gear									
134.19 (100.07)	10152 (45.16)	4.95 (7.97)	1905	3.22	0.454 (0.276)	15.21 (3.00)	186 (86)	56 (13)	29.05 (98.37)
10th Gear									
135.54 (101.07)	9019 (40.12)	5.64 (9.07)	1901	2.88	0.438 (0.272)	15.35 (3.02)	185 (85)	54 (12)	29.06 (98.41)
11th Gear									
134.55 (100.34)	7751 (34.48)	6.52 (10.50)	1902	2.44	0.448 (0.272)	15.43 (3.04)	185 (85)	57 (14)	28.99 (98.17)
12th Gear									
133.28 (99.38)	7145 (31.78)	7.31 (11.77)	1902	2.30	0.452 (0.275)	15.28 (3.01)	185 (85)	58 (14)	28.98 (98.14)
13th Gear									
135.19 (100.81)	5587 (24.85)	9.07 (14.60)	1909	2.01	0.447 (0.272)	15.48 (3.05)	185 (85)	58 (14)	28.98 (98.14)

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with official OECD, SAE and Nebraska test procedures. For the maximum power tests, the fuel temperature at the injection pump return was maintained at 125° F *(52° C)*. This tractor is equipped with a variable speed cooling fan. Since engine power is influenced by fan speed, all power tests were conducted at approximately the same ambient air temperatures. This tractor did not meet manufacturers 3 point lift capacity claim of 8870 lb *(4023 kg)* or 9710 lb *(4404 kg)* with lift assist cylinder. The performance figures on this summary were taken from a test conducted under the OECD restricted standard test code procedure.

Report reissued. Supplemental sales permit for John Deere 4560 Powershift Diesel, November, 1991.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1620**, Summary 058, December 22, 1989.

LOUIS I. LEVITICUS
Engineer-in-Charge

K. VON BARGEN
R. D. GRISSO
L. L. BASHFORD
Board of Tractor Test Engineers

DRAWBAR PERFORMANCE AT 2200 RPM

MAXIMUM POWER IN SELECTED GEARS—BALLASTED TRACTOR

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp °F (°C) cool-ing med	Temp °F (°C) Air dry bulb	Barom. inch Hg (kPa)
				3rd Gear					
114.57 (85.43)	20925 (93.07)	2.05 (3.30)	2255	14.38	0.522 (0.318)	13.21 (2.61)	185 (85)	50 (10)	28.99 (98.17)
				4th Gear					
130.73 (97.49)	17759 (78.99)	2.76 (4.44)	2200	6.91	0.474 (0.288)	14.59 (2.87)	185 (85)	50 (10)	29.05 (98.37)
				5th Gear					
132.35 (98.70)	15515 (69.02)	3.24 (5.22)	2201	3.90	0.461 (0.280)	14.93 (2.94)	184 (84)	53 (12)	29.07 (98.44)
				6th Gear					
134.32 (100.16)	13576 (60.39)	3.71 (5.97)	2201	3.50	0.458 (0.279)	15.09 (2.97)	184 (84)	53 (12)	29.06 (98.41)
				7th Gear					
135.08 (100.73)	11755 (52.29)	4.31 (6.94)	2201	3.64	0.460 (0.280)	15.05 (2.96)	184 (84)	52 (11)	29.07 (98.44)
				8th Gear					
129.25 (96.38)	9745 (43.35)	4.97 (8.00)	2198	3.22	0.482 (0.293)	14.35 (2.83)	184 (84)	56 (13)	29.00 (98.21)
				9th Gear					
128.43 (95.77)	8362 (37.20)	5.76 (9.27)	2190	2.70	0.481 (0.292)	14.38 (2.83)	185 (85)	56 (13)	29.00 (98.21)
				10th Gear					
129.73 (96.74)	7430 (33.05)	6.55 (10.54)	2198	2.44	0.474 (0.288)	14.57 (2.87)	184 (84)	55 (13)	29.08 (98.48)
				11th Gear					
128.27 (95.65)	6352 (28.25)	7.57 (12.19)	2199	2.10	0.485 (0.295)	14.30 (2.82)	185 (85)	57 (14)	28.99 (98.17)
				12th Gear					
131.46 (98.03)	5805 (25.82)	8.49 (13.67)	2201	2.01	0.467 (0.284)	14.79 (2.91)	184 (84)	57 (14)	28.98 (98.14)

TRACTOR SOUND LEVEL WITH CAB	dB(A)
Gear closest to 4.7 mph (7.5 km/h)—7th Gear	76.5
Maximum sound level	77.0
Transport speed—no load—15th Gear	77.5
Bystander in 15th Gear	88.0

LUGGING ABILITY IN 10th GEAR

Crankshaft Speed rpm	2198	1981	1763	1539	1321	1098
Pull—lbs (kN)	7430 (33.05)	8602 (38.26)	9696 (43.13)	10145 (45.12)	10012 (44.54)	9573 (42.58)
Increase in Pull %	0	16	30	37	35	29
Power—Hp (kW)	129.73 (96.74)	134.94 (100.62)	134.91 (100.60)	122.30 (91.20)	104.09 (77.62)	82.61 (61.60)
Speed—Mph (km/h)	6.55 (10.54)	5.88 (9.47)	5.22 (8.40)	4.55 (7.32)	3.90 (6.27)	3.24 (5.21)
Slip %	2.44	2.62	2.90	3.30	3.30	2.96

THREE POINT HITCH PERFORMANCE (SAE Static Test)

Observed Maximum Pressure psi (bar)	2550 (176)
Location	remote outlet
Hydraulic oil temperature °F (°C)	130 (54)
Location	hydraulic sump
Category	III
Quick attach	Yes

Hitch point distance to ground level in (mm)	9.0 (229)	16.0 (406)	25.0 (635)	33.0 (838)	40.0 (1016)
Lift force on frame lb (kN)	8740 (38.9)	9229 (41.1)	9432 (42.0)	8944 (39.8)	8285 (36.9)
		with 2 44 mm lift assist cylinder			
Hitch point distance to ground level in (mm)	9.0 (229)	16.0 (406)	25.0 (635)	33.0 (838)	40.0 (1016)
Lift force on frame lb (kN)	9861 (43.9)	10570 (47.0)	10954 (48.7)	10224 (45.5)	9411 (41.9)
		with 2 55 mm lift assist cylinder			
Hitch point distance to ground level in (mm)	9.0 (229)	16.0 (406)	25.0 (635)	33.0 (838)	40.0 (1016)
Lift force on frame lb (kN)	10518 (46.8)	11454 (50.9)	11176 (49.7)	10792 (48.0)	10041 (44.7)

TIRES AND WEIGHT		With Ballast	Without Ballast
Rear Tires	No., size, ply & psi (kPa)	Four 18.4R42; ** 12 (83)	Two 18.4R42; ** 18 (124)
Ballast	Liquid (total)	1730 lb (785 kg)	None
	Cast Iron (total)	1090 lb (494 kg)	None
Front Tires	No., size, ply & psi (kPa)	Two 14.9R30; *** 30 (207)	Two 14.9R30; *** 30 (207)
Ballast	Iron Equip (total)	190 lb (86 kg)	None
	Cast Iron (total)	1100 lb (499 kg)	None
Height of Drawbar		18.5 in (470 mm)	18.5 in (470 mm)
Static Weight	Rear	13860 lb (6287 kg)	11565 lb (5246 kg)
	Front	7915 lb (3590 kg)	5590 lb (2536 kg)
	Total	21775 lb (9877 kg)	17155 lb (7781 kg)

THREE POINT HITCH PERFORMANCE (OECD Static Test)

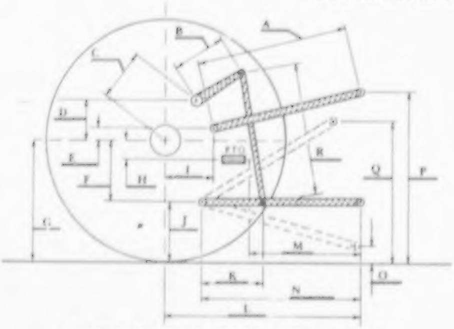
CATEGORY: III

Quick Attach: Yes

Maximum Force Exerted Through Whole Range	5821 lbs (25.9 kN) *6614 lbs (29.4 kN) **7057 lbs (31.4 kN)
i) Opening pressure of relief valve	
Sustained pressure with pump stalled	2550 psi (176 Bar)
ii) Pump delivery rate at minimum pressure and rated engine speed	32.8 GPM (124.2 l/min)
iii) Pump delivery rate at maximum hydraulic power	31.7 GPM (120.0 l/min)
Delivery pressure	1750 psi (121 Bar)
Power	32.4 Hp (24.2 kW)

*with 44 mm lift assist cylinder

**with 55 mm lift assist cylinder



HITCH DIMENSIONS AS TESTED—NO LOAD

	inch	mm
A	28.1	714
B	18.4	468
C	12.9	327
D	12.9	327
E	6.8	172
F	13.0	330
G	35.1	892
H	7.0	177
I	15.1	384
J	22.1	562
K	28.2	716
L	44.3	1124
L'	49.3	1251
M	22.3	565
N	38.1	968
O	9.1	231
P	44.1	1121
Q	41.5	1053
R	37.3	946

L' to end of Quick attach

John Deere 4555 Powershift Diesel

Agricultural Research Division
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Darrell Nelson, Dean and Director

NEBRASKA OECD TRACTOR TEST 1621—SUMMARY 059
JOHN DEERE 4755 POWERSHIFT DIESEL
ALSO JOHN DEERE 4760 POWERSHIFT DIESEL
15 SPEED

POWER TAKE-OFF PERFORMANCE

Power HP (kW)	Crank shaft speed rpm	Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Mean Atmospheric Conditions
MAXIMUM POWER AND FUEL CONSUMPTION					
Rated Engine Speed—(PTO speed—998 rpm)					
177.06 (132.04)	2200	9.73 (36.82)	0.380 (0.231)	18.20 (3.59)	
Maximum Power (2 Hours)					
178.06 (132.78)	2050	9.61 (36.38)	0.371 (0.226)	18.62 (3.67)	
VARYING POWER AND FUEL CONSUMPTION					Air temperature
177.06 (132.04)	2200	9.73 (36.82)	0.380 (0.231)	18.20 (3.59)	78°F (25°C)
155.14 (115.69)	2265	8.85 (33.52)	0.394 (0.240)	17.52 (3.45)	Relative humidity
117.70 (87.77)	2292	7.16 (27.12)	0.421 (0.256)	16.43 (3.24)	49%
79.51 (59.29)	2325	5.51 (20.87)	0.479 (0.291)	14.42 (2.84)	Barometer
40.16 (29.95)	2355	3.96 (14.82)	0.685 (0.416)	10.16 (2.00)	28.74" Hg (97.33 kPa)
2.08 (1.55)	2375	2.30 (8.71)	7.651 (4.654)	0.90 (0.18)	

Maximum Torque 569 lb.-ft. (771 Nm) at 1450 rpm
Maximum Torque Rise 34.5%
Torque Rise at 1600 engine rpm 12%

DRAWBAR PERFORMANCE
FUEL CONSUMPTION CHARACTERISTICS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp °F (°C) cooling med	Temp °F (°C) Air dry bulb	Barom. inch Hg (kPa)
Maximum Power—12th Gear									
147.76 (110.19)	6267 (27.88)	8.84 (14.23)	2201	2.43	0.455 (0.277)	15.10 (2.98)	186 (86)	58 (14)	29.07 (98.44)
75% of Pull at Maximum Power—12th Gear									
115.26 (85.95)	4697 (20.89)	9.20 (14.81)	2282	1.66	0.495 (0.301)	13.91 (2.74)	184 (84)	61 (16)	29.04 (98.34)
50% of Pull at Maximum Power—12th Gear									
78.04 (58.20)	3132 (13.93)	9.34 (15.04)	2305	1.32	0.569 (0.346)	12.10 (2.38)	183 (83)	58 (14)	29.03 (98.30)
75% of Pull at Reduced Engine Speed—15th Gear									
115.49 (86.12)	4707 (20.94)	9.20 (14.81)	1942	1.66	0.459 (0.279)	15.00 (2.95)	187 (86)	54 (12)	29.03 (98.30)
50% of Pull at Reduced Engine Speed—15th Gear									
78.12 (58.25)	3131 (13.93)	9.36 (15.06)	1865	1.32	0.513 (0.312)	13.43 (2.65)	181 (83)	58 (14)	29.03 (98.30)

Location of Test: Center for Agricultural Equipment, Lincoln Nebraska 68583-0832, U.S.A.

Dates of Test: April-May, 1989.

Manufacturer: John Deere Waterloo Works, P.O. Box 3500, Waterloo, Iowa 50704.

FUEL OIL and TIME: Fuel No. 2 Diesel **Cetane No.** 51.1 **Specific gravity converted to 60°/60°F** *(15°/15°C)* 0.8301 **Fuel weight** 6.912 lbs/gal *(0.828 kg/l)* **Oil SAE** 15W40 **API service classification** CD/SD **To motor** 4.915 gal *(18.606 l)* **Drained from motor** 4.667 gal *(17.666 l)* **Transmission and hydraulic lubricant** John Deere Hy-Gard fluid **Front axle lubricant** John Deere LL-5 Gear Lubricant 85W-140 **Total time engine was operated** 28.0 hours.

ENGINE: Make John Deere Diesel **Type** six cylinder vertical with turbocharger and intercooler **Serial No.** **RG6076A102454** **Crankshaft** lengthwise **Rated engine speed** 2200 **Bore and stroke** (as specified) 4.56" × 4.75" *(115.8 mm × 120.7 mm)* **Compression ratio** 16.0 to 1 **Displacement** 466 cu in *(7634 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements **Oil filter** one full flow cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** one paper element and prefilter **Muffler** vertical **Cooling medium temperature control** 2 thermostats and variable speed fan.

ENGINE OPERATING PARAMETERS: Fuel rate 66.6-72.8 lb/hr *(30.2-33.0 kg/hr)* **High idle** 2350-2400 rpm **Turbo boost** nominal 16-19 psi *(110-131 kPa)* as measured 16.5 psi *(114 kPa)*.

CHASSIS: Type front wheel assist **Serial No.** **RW4755P001033** **Tread width** rear 64.6" *(1642 mm)* to 115.7" *(2938 mm)* front 66.8" *(1697 mm)* to 87.0" *(2210 mm)* **Wheel base** 117.1" *(2974 mm)* **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with full range operator controlled powershift **Nominal travel speeds mph (km/h)** first 1.42 *(2.29)* second 2.03 *(3.27)* third 2.45 *(3.95)* fourth 3.08 *(4.96)* fifth 3.55 *(5.71)* sixth 4.03 *(6.49)* seventh 4.64 *(7.47)* eighth 5.33 *(8.58)* ninth 6.14 *(9.89)* tenth 6.97 *(11.22)* eleventh 8.03 *(12.93)* twelfth 8.93 *(14.38)* thirteenth 11.12 *(17.90)* fourteenth 15.56 *(25.04)* fifteenth 19.25 *(30.98)* reverse 1.96 *(3.16)*, 2.81 *(4.52)*, 4.27 *(6.87)*, 6.28 *(10.11)* **Clutch** multiple wet disc hydraulically power actuated by foot pedal **Brakes** multiple wet disc hydraulically power actuated by two foot pedals which can be locked together **Steering** hydrostatic **Power take-off** 998 rpm at 2200 engine rpm **Unladen tractor mass** 18165 lb *(8239 kg)*.

DRAWBAR PERFORMANCE AT 2050 RPM
MAXIMUM POWER IN SELECTED GEARS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp °F (°C) cooling med	Temp °F (°C) Air dry bulb	Barom. inch Hg (kPa)
5th Gear									
133.33 (99.42)	10452 (46.49)	4.84 (7.79)	2102	14.78	0.502 (0.305)	13.77 (2.71)	184 (84)	55 (13)	29.15 (98.71)
6th Gear									
145.68 (108.64)	14852 (66.06)	3.68 (5.92)	2175	8.25	0.461 (0.280)	14.98 (2.95)	184 (84)	56 (13)	29.11 (98.58)
7th Gear									
149.51 (111.49)	13967 (62.13)	4.01 (6.46)	2053	6.55	0.444 (0.270)	15.55 (3.06)	184 (84)	56 (13)	29.16 (98.75)
8th Gear									
147.50 (109.99)	11615 (51.66)	4.76 (7.66)	2050	4.92	0.446 (0.271)	15.41 (3.04)	187 (86)	57 (14)	29.09 (98.51)
9th Gear									
148.21 (110.52)	10021 (44.58)	5.55 (8.93)	2052	4.08	0.447 (0.272)	15.44 (3.04)	187 (86)	58 (14)	29.08 (98.48)
10th Gear									
150.57 (112.28)	8929 (39.72)	6.32 (10.18)	2053	3.42	0.444 (0.270)	15.58 (3.07)	186 (86)	58 (14)	29.08 (98.48)
11th Gear									
148.54 (110.76)	7597 (33.79)	7.33 (11.80)	2053	2.88	0.446 (0.271)	15.51 (3.06)	186 (86)	58 (14)	29.07 (98.44)
12th Gear									
151.90 (112.86)	6901 (30.70)	8.25 (13.28)	2053	2.03	0.450 (0.274)	15.41 (3.04)	186 (86)	60 (16)	29.08 (98.48)
15th Gear									
146.82 (109.48)	5386 (23.96)	10.22 (16.45)	2053	2.16	0.451 (0.274)	15.41 (3.04)	186 (86)	61 (16)	29.05 (98.37)

DRAWBAR PERFORMANCE AT 2050 RPM
MAXIMUM POWER IN SELECTED GEARS—BALLASTED TRACTOR

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp °F (°C) cooling med	Temp °F (°C) Air dry bulb	Barom. inch Hg (kPa)
3rd Gear									
133.73 (99.72)	21181 (94.21)	2.37 (3.81)	2202	9.34	0.521 (0.317)	14.03 (2.76)	185 (85)	55 (13)	29.02 (98.27)
4th Gear									
135.08 (100.73)	18092 (80.48)	2.84 (4.57)	2164	7.61	0.507 (0.308)	13.81 (2.72)	187 (86)	57 (14)	29.01 (98.24)
5th Gear									
145.84 (108.75)	16667 (74.14)	3.27 (5.27)	2133	5.13	0.481 (0.293)	15.00 (2.95)	186 (85)	60 (16)	28.99 (98.17)
6th Gear									
151.62 (113.06)	15727 (69.96)	3.62 (5.82)	2053	4.26	0.437 (0.266)	15.92 (3.14)	187 (86)	62 (17)	28.93 (97.96)
7th Gear									
149.61 (111.56)	13376 (59.50)	4.19 (6.75)	2053	3.65	0.447 (0.272)	15.62 (3.08)	187 (86)	63 (17)	28.93 (97.96)
8th Gear									
145.53 (108.52)	11240 (50.00)	4.85 (7.81)	2050	2.91	0.451 (0.274)	15.22 (3.00)	186 (86)	62 (17)	28.92 (97.93)
9th Gear									
146.62 (109.33)	9726 (43.26)	5.65 (9.10)	2053	2.45	0.451 (0.274)	15.23 (3.00)	187 (86)	61 (16)	28.94 (98.00)
10th Gear									
146.05 (108.91)	8607 (38.29)	6.36 (10.24)	2053	2.27	0.451 (0.274)	15.33 (3.02)	186 (86)	63 (17)	28.91 (97.90)
11th Gear									
145.44 (108.45)	7376 (32.81)	7.39 (11.90)	2051	1.98	0.456 (0.277)	15.06 (2.97)	187 (86)	63 (17)	28.88 (97.80)
12th Gear									
150.02 (111.87)	6817 (30.32)	8.25 (13.28)	2053	1.76	0.453 (0.276)	15.15 (2.98)	186 (86)	63 (17)	28.87 (97.76)
15th Gear									
145.69 (108.64)	5346 (23.78)	10.30 (16.57)	2054	1.94	0.455 (0.277)	15.08 (2.97)	183 (84)	63 (17)	28.87 (97.76)

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with official OECD, SAE and Nebraska test procedures. For the maximum power tests, the fuel temperature at the injection pump return was maintained at 125°F (52°C). This tractor is equipped with a variable speed cooling fan. Since engine power is influenced by fan speed, all power tests were conducted at approximately the same ambient air temperature. This tractor did not meet manufacturer's 3 point lift capacity claim of 8870 lb (4023 kg) or 9710 lb (4404 kg) with lift assist cylinder. The pull in 3rd gear (ballasted tractor) was limited to avoid tractor bouncing. The performance figures on this summary were taken from a test conducted under the OECD restricted standard test code procedure.

Report reissued: Supplemental sales permit for John Deere 4760 Powershift Diesel, November, 1991.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1621**, Summary 059, December 22, 1989.

LOUIS I. LEVITICUS
Engineer-in-Charge

K. VON BARGEN
R. D. GRISSO
L. L. BASHFORD
Board of Tractor Test Engineers

DRAWBAR PERFORMANCE AT 2200 RPM

MAXIMUM POWER IN SELECTED GEARS—BALLASTED TRACTOR

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temp °F (°C) cool-ing med	Air dry bulb	Barom. inch Hg (kPa)
				3rd Gear					
128.71 (95.98)	21192 (94.27)	2.28 (3.67)	2201	10.19	[illegible]	[illegible]	180 [illegible]	[illegible]	[illegible]
				4th Gear					
[illegible]	[illegible]	[illegible]	2202	[illegible]	[illegible]	[illegible]	180	[illegible]	[illegible]
				5th Gear					
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
				6th Gear					
[illegible]	[illegible]	[illegible]	2202	[illegible]	[illegible]	[illegible]	180	[illegible]	[illegible]
				7th Gear					
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	180	[illegible]	[illegible]
				8th Gear					
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	180	[illegible]	[illegible]
				9th Gear					
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
				10th Gear					
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
				11th Gear					
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
				12th Gear					
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

TRACTOR SOUND LEVEL WITH CAB	dB(A)
Gear chosen at 4.7 mph (7.5 km/h)—7th Gear	[illegible]
Maximum sound level	[illegible]
Transport speed—no load—15th Gear	[illegible]
Bystander in 15th Gear	[illegible]

LUGGING ABILITY IN 10th GEAR

Crankshaft Speed rpm	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Pull—lbs (kN)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Increase in Pull %	0	14	[illegible]	[illegible]	[illegible]	[illegible]
Power—Hp (kW)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Speed—Mph (km/h)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Slip %	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

THREE POINT HITCH PERFORMANCE (SAE Static Test)

Observed Maximum Pressure psi (bar)	[illegible]
Location	[illegible]
Hydraulic oil temperature °F (°C)	[illegible]
Location	transmission sump
Category	III
Quick attach	Yes

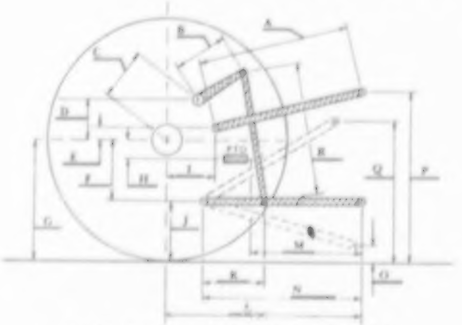
Hitch point distance to ground level in. (mm)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Lift force on frame lb. (kN)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		with 1.88 mm lift assist cylinder			
Hitch point distance to ground level in. (mm)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Lift force on frame lb. (kN)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		with 1.58 mm lift assist cylinder			
Hitch point distance to ground level in. (mm)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Lift force on frame lb. (kN)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

TIRES AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi (kPa)	[illegible]	[illegible]
Ballast	—Liquid (total)	[illegible]	None
	—Cast iron (total)	[illegible]	None
Front Tires	—No., size, ply & psi (kPa)	[illegible]	[illegible]
Ballast	—Liquid (total)	[illegible]	None
	—Cast iron (total)	[illegible]	None
Height of Drawbar		[illegible]	[illegible]
Static Weight	—Rear	[illegible]	[illegible]
	—Front	[illegible]	[illegible]
	—Total	[illegible]	[illegible]

THREE POINT HITCH PERFORMANCE (OECD Static Test)

CATEGORY: III	
Quick Attach: Yes	
Maximum Force Exerted Through Whole Range	[illegible]
	[illegible]
	[illegible]
i) Opening pressure of relief valve	N/A
Sustained pressure with pump stalled	[illegible]
ii) Pump delivery rate at minimum pressure	[illegible]
iii) Pump delivery rate at maximum hydraulic power	[illegible]
Delivery pressure	[illegible]
Power	[illegible]

*with [illegible] mm lift assist cylinder
**with [illegible] mm lift assist cylinder



HITCH DIMENSIONS AS TESTED—NO LOAD

	inch	mm
A	28.1	714
B	18.4	468
C	12.9	327
D	12.9	327
E	6.8	172
F	[illegible]	[illegible]
G	[illegible]	[illegible]
H	7.0	177
I	15.1	384
J	[illegible]	[illegible]
K	28.2	716
L	44.3	1124
L'	[illegible]	[illegible]
M	[illegible]	[illegible]
N	38.1	968
O	10.1	257
P	45.1	1146
Q	42.5	1080
R	37.3	[illegible]

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John Deere 4755 Powershift Diesel

Agricultural Research Division
Institute of Agriculture and Natural Resources
University of Nebraska-Lincoln
Darrell Nelson, Dean and Director

NEBRASKA OECD TRACTOR TEST 1622—SUMMARY 060
JOHN DEERE 4955 POWERSHIFT DIESEL
ALSO JOHN DEERE 4960 POWERSHIFT DIESEL
15 SPEED

POWER TAKE-OFF PERFORMANCE

Power HP (kW)	Crank shaft speed rpm	Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Mean Atmospheric Conditions
MAXIMUM POWER AND FUEL CONSUMPTION					
Rated Engine Speed—(PTO speed—998 rpm)					
202.73 (151.18)	2200	11.02 (41.72)	0.376 (0.229)	18.39 (3.62)	
Maximum Power (2 Hours)					
210.00 (156.60)	1951	10.95 (41.44)	0.360 (0.219)	19.18 (3.78)	
VARYING POWER AND FUEL CONSUMPTION					Air temperature
202.73 (151.18)	2200	11.02 (41.72)	0.376 (0.229)	18.39 (3.62)	74°F (23°C)
177.23 (132.16)	2260	10.03 (37.95)	0.391 (0.238)	17.68 (3.48)	Relative humidity
134.91 (100.60)	2297	7.99 (30.23)	0.409 (0.249)	16.89 (3.33)	40%
91.46 (68.20)	2330	6.12 (23.17)	0.462 (0.281)	14.95 (2.94)	Barometer
46.05 (34.34)	2356	4.30 (16.27)	0.645 (0.392)	10.72 (2.11)	28.69" Hg (97.14 kPa)
0.77 (0.57)	2368	2.39 (9.04)	21.517 (13.088)	0.32 (0.06)	

Maximum Torque 670 lb.-ft (909 Nm) at 1350 rpm
Maximum Torque Rise 38.5%
Torque Rise at 1000 engine rpm 11%

DRAWBAR PERFORMANCE
FUEL CONSUMPTION CHARACTERISTICS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp °F (°C) cool ing med	Temp °F (°C) Air dry bulb	Barom inch Hg (kPa)
Maximum Power—12th Gear									
176.48 (131.60)	7406 (32.94)	8.94 (14.38)	2197	2.66	0.434 (0.264)	15.93 (3.14)	186 (86)	50 (10)	28.77 (97.43)
75% of Pull at Maximum Power—12th Gear									
137.77 (102.73)	5614 (24.97)	9.20 (14.81)	2277	2.30	0.473 (0.287)	14.69 (2.89)	184 (84)	64 (18)	28.75 (97.36)
50% of Pull at Maximum Power—12th Gear									
93.98 (70.08)	3748 (16.67)	9.40 (15.13)	2312	1.65	0.534 (0.325)	12.95 (2.55)	182 (83)	65 (18)	28.74 (97.32)
75% of Pull at Reduced Engine Speed—13th Gear									
137.83 (102.78)	5620 (25.00)	9.20 (14.80)	1899	2.20	0.451 (0.274)	15.33 (3.02)	187 (86)	64 (18)	28.75 (97.36)
50% of Pull at Reduced Engine Speed—13th Gear									
93.79 (69.94)	3742 (16.65)	9.40 (15.13)	1868	1.56	0.497 (0.303)	13.90 (2.74)	180 (82)	68 (20)	28.74 (97.32)

Location of Test: Center for Agricultural Equipment, Lincoln Nebraska 68583-0832, U.S.A.

Dates of Test: April-June, 1989

Manufacturer: John Deere Waterloo Works, P.O. Box 3500, Waterloo, Iowa 50704

FUEL OIL and TIME: Fuel No. 2 Diesel **Cetane No.** 51.1 **Specific gravity converted to 60°/60°F** *(15°/15°C)* 0.8301 **Fuel weight** 6.912 lbs/gal *(0.828 kg/l)* **Oil SAE** 15W40 **API service classification** CD/SD **To motor** 4.828 gal *(18.277 l)* **Drained from motor** 4.483 gal *(16.969 l)* **Transmission and hydraulic lubricant** John Deere HyGard fluid **Front axle lubricant** John Deere GL-5 Gear Lubricant 85W-140 **Total time engine was operated** 37.5 hours.

ENGINE: Make John Deere Diesel **Type** six cylinder vertical with turbocharger and intercooler **Serial No.** *RG6076A103490* **Crankshaft** lengthwise **Rated engine speed** 2200 **Bore and stroke** (as specified) 4.56" × 4.75" *(115.8 mm × 120.7 mm)* **Compression ratio** 16.0 to 1 **Displacement** 466 cu in *(7634 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements **Oil filter** one full flow cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** one paper element and prefilter **Muffler** vertical **Cooling medium temperature control** 2 thermostats and variable speed fan.

ENGINE OPERATING PARAMETERS: Fuel rate 75.3-82.2 lb/hr *(34.2-37.3 kg/hr)* **High idle** 2350-2400 rpm **Turbo boost** nominal 16-19 psi *(110-131 kPa)* as measured 16.7 psi *(115 kPa)*

CHASSIS: Type front wheel assist **Serial No.** *RW4955P001021* **Tread width** rear 64.6" *(1642 mm)* to 115.7" *(2938 mm)* front 66.6" *(1691 mm)* to 87.8" *(2230 mm)* **Wheel base** 117.1" *(2974 mm)* **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with full range operator controlled powershift **Nominal travel speeds mph (km/h)** first 1.42 *(2.29)* second 2.03 *(3.27)* third 2.46 *(3.96)* fourth 3.09 *(4.97)* fifth 3.56 *(5.72)* sixth 4.04 *(6.50)* seventh 4.65 *(7.49)* eighth 5.34 *(8.60)* ninth 6.16 *(9.91)* tenth 6.99 *(11.24)* eleventh 8.05 *(12.95)* twelfth 9.00 *(14.49)* thirteenth 11.14 *(17.93)* fourteenth 15.58 *(25.08)* fifteenth 19.29 *(31.04)* reverse 1.97 *(3.17)*, 2.81 *(4.53)*, 4.27 *(6.88)*, 6.44 *(10.36)* **Clutch** multiple wet disc hydraulically power actuated by foot pedal **Brakes** multiple wet disc hydraulically power actuated by two foot pedals which can be locked together **Steering** hydrostatic **Power take-off** 998 rpm at 2200 engine rpm **Unladen tractor mass** 18370 lb *(8332 kg)*.

DRAWBAR PERFORMANCE AT 1950 RPM
MAXIMUM POWER IN SELECTED GEARS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp °F (°C) cool ing med	Temp °F (°C) Air dry bulb	Barom inch Hg (kPa)
6th Gear									
158.13 (117.92)	17021 (75.71)	3.48 (5.61)	2201	14.57	0.480 (0.292)	14.39 (2.83)	186 (85)	52 (11)	28.78 (97.46)
7th Gear									
171.46 (127.86)	15092 (67.13)	4.26 (6.86)	2165	7.80	0.434 (0.264)	15.92 (3.14)	187 (86)	57 (14)	28.78 (97.46)
8th Gear									
172.81 (128.87)	14398 (64.05)	4.50 (7.24)	1952	6.06	0.440 (0.268)	15.71 (3.09)	186 (85)	50 (10)	28.77 (97.43)
9th Gear									
174.49 (130.12)	12465 (55.44)	5.25 (8.45)	1950	4.87	0.434 (0.264)	15.94 (3.14)	188 (87)	50 (10)	28.77 (97.43)
10th Gear									
177.01 (132.00)	11045 (49.13)	6.01 (9.67)	1952	4.08	0.430 (0.262)	16.06 (3.16)	187 (86)	50 (10)	28.77 (97.43)
11th Gear									
176.21 (131.40)	9500 (42.26)	6.96 (11.19)	1949	3.38	0.427 (0.260)	16.18 (3.19)	188 (87)	50 (10)	28.77 (97.43)
12th Gear									
182.82 (136.33)	8760 (38.96)	7.83 (12.60)	1954	3.02	0.411 (0.250)	16.80 (3.31)	188 (86)	50 (10)	28.77 (97.43)
13th Gear									
177.61 (132.44)	6858 (30.50)	9.71 (15.63)	1947	2.48	0.427 (0.260)	16.17 (3.19)	188 (87)	51 (11)	28.78 (97.46)

DRAWBAR PERFORMANCE AT 1950 RPM
MAXIMUM POWER IN SELECTED GEARS—BALLASTED TRACTOR

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp °F (°C) cool ing med	Temp °F (°C) Air dry bulb	Barom inch Hg (kPa)
3rd Gear									
145.69 (108.64)	23715 (105.49)	2.30 (3.71)	2264	9.68	0.484 (0.295)	14.27 (2.81)	185 (85)	50 (10)	28.83 (97.63)
4th Gear									
167.70 (125.05)	22457 (99.89)	2.80 (4.51)	2146	7.69	0.458 (0.279)	15.08 (2.97)	188 (86)	50 (10)	28.84 (97.66)
5th Gear									
171.50 (127.89)	20351 (90.52)	3.16 (5.09)	2058	5.62	0.449 (0.273)	15.41 (3.04)	187 (86)	53 (12)	28.86 (97.73)
6th Gear									
174.65 (130.24)	18589 (82.69)	3.52 (5.67)	2001	4.68	0.434 (0.264)	15.94 (3.14)	187 (86)	64 (18)	28.66 (97.05)
7th Gear									
176.56 (131.66)	16602 (73.85)	3.99 (6.42)	1952	4.07	0.428 (0.260)	16.14 (3.18)	189 (87)	65 (18)	28.67 (97.09)
8th Gear									
172.76 (128.83)	14000 (62.28)	4.63 (7.45)	1955	3.10	0.438 (0.267)	15.77 (3.11)	188 (86)	60 (16)	28.66 (97.05)
9th Gear									
173.90 (129.68)	12182 (54.19)	5.35 (8.62)	1951	2.74	0.436 (0.265)	15.87 (3.13)	189 (87)	52 (11)	29.00 (98.21)
10th Gear									
174.83 (130.37)	10785 (47.97)	6.08 (9.78)	1947	2.38	0.433 (0.264)	15.95 (3.14)	188 (87)	52 (11)	29.01 (98.24)
11th Gear									
172.83 (128.88)	9219 (41.01)	7.03 (11.31)	1949	2.29	0.438 (0.267)	15.78 (3.11)	189 (87)	53 (12)	29.02 (98.27)
12th Gear									
179.11 (133.56)	8500 (37.81)	7.90 (12.71)	1955	1.93	0.424 (0.258)	16.42 (3.23)	188 (87)	54 (12)	29.01 (98.24)
13th Gear									
173.13 (129.10)	6622 (29.45)	9.80 (15.78)	1956	1.74	0.437 (0.266)	15.83 (3.12)	188 (87)	57 (14)	29.06 (98.41)

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with official OECD, SAE and Nebraska test procedures. For the maximum power tests, the fuel temperature at the injection pump return was maintained at 141° F *(61° C)*. This tractor is equipped with a variable speed cooling fan. Since engine power is influenced by fan speed, all power tests were conducted at approximately the same ambient air temperatures. This tractor did not meet manufacturers 3 point lift capacity claim of 9710 lb *(4404 kg)*. The pull in 3rd gear (ballasted tractor) was limited to avoid tractor bouncing. The performance figures on this summary were taken from a test conducted under the OECD restricted standard test code procedure.

Report reissued. Supplemental sales permit for John Deere 4960 Powershift Diesel, November, 1991.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1622,** Summary 060, December 22, 1989.

LOUIS I. LEVITICUS
Engineer-in-Charge

K. VON BARGEN
R. D. GRISSO
L. L. BASHFORD
Board of Tractor Test Engineers

DRAWBAR PERFORMANCE AT 2200 RPM
MAXIMUM POWER IN SELECTED GEARS--BALLASTED TRACTOR

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp °F (°C) cooling med	Temp °F (°C) Air dry bulb	Barom inch Hg (kPa)
				3rd Gear					
147.00 *(109.62)*	23742 *(105.61)*	2.32 *(3.74)*	2268	8.97	0.479 *(0.291)*	14.44 *(2.84)*	184 *(84)*	50 *(10)*	28.83 *(97.63)*
				4th Gear					
167.25 *(124.72)*	21627 *(96.20)*	2.90 *(4.67)*	2200	6.79	0.460 *(0.280)*	15.04 *(2.96)*	186 *(86)*	53 *(12)*	28.84 *(97.66)*
				5th Gear					
170.97 *(127.49)*	18770 *(83.49)*	3.42 *(5.50)*	2203	4.68	0.446 *(0.271)*	15.49 *(3.05)*	187 *(86)*	53 *(12)*	28.85 *(97.70)*
				6th Gear					
173.51 *(129.38)*	16639 *(74.01)*	3.91 *(6.29)*	2202	3.99	0.440 *(0.268)*	15.70 *(3.09)*	186 *(85)*	63 *(17)*	28.66 *(97.05)*
				7th Gear					
171.88 *(128.19)*	14254 *(63.40)*	4.52 *(7.28)*	2197	3.37	0.445 *(0.270)*	15.55 *(3.06)*	186 *(86)*	65 *(18)*	28.67 *(97.09)*
				8th Gear					
167.25 *(124.72)*	11969 *(53.24)*	5.24 *(8.43)*	2201	2.74	0.457 *(0.278)*	15.14 *(2.98)*	186 *(86)*	60 *(16)*	28.66 *(97.05)*
				9th Gear					
166.96 *(124.50)*	10347 *(46.02)*	6.05 *(9.74)*	2199	2.29	0.455 *(0.277)*	15.18 *(2.99)*	187 *(86)*	52 *(11)*	29.00 *(98.21)*
				10th Gear					
167.80 *(125.13)*	9131 *(40.61)*	6.89 *(11.09)*	2201	2.02	0.455 *(0.277)*	15.18 *(2.99)*	187 *(86)*	52 *(11)*	29.01 *(98.24)*
				11th Gear					
166.86 *(124.42)*	7864 *(34.98)*	7.96 *(12.81)*	2200	1.93	0.458 *(0.279)*	15.08 *(2.97)*	188 *(86)*	54 *(12)*	29.03 *(98.31)*
				12th Gear					
170.68 *(127.27)*	7181 *(31.94)*	8.91 *(14.34)*	2200	1.83	0.447 *(0.272)*	15.47 *(3.05)*	186 *(86)*	56 *(13)*	29.05 *(98.37)*

TRACTOR SOUND LEVEL WITH CAB	dB(A)
Gear closest to 4.7 mph *(7.5 km/h)*—7th Gear	76.5
Maximum sound level	77.5
Transport speed—no load—15th Gear	79.0
Bystander in 15th Gear	87.0

LUGGING ABILITY IN 10th GEAR

Crankshaft Speed rpm	2201	1981	1760	1539	1323	1104
Pull—lbs *(kN)*	9131 *(40.61)*	10579 *(47.06)*	11754 *(52.28)*	12731 *(56.63)*	12792 *(56.90)*	10434 *(46.41)*
Increase in Pull %	0	16	29	39	40	14
Power—Hp *(kW)*	167.80 *(125.13)*	174.63 *(130.22)*	171.96 *(128.23)*	162.45 *(121.14)*	140.26 *(104.59)*	95.90 *(71.51)*
Speed—Mph *(km/h)*	6.89 *(11.09)*	6.19 *(9.96)*	5.49 *(8.83)*	4.79 *(7.70)*	4.11 *(6.62)*	3.45 *(5.55)*
Slip %	2.02	2.29	2.47	2.83	2.83	2.47

TIRES AND WEIGHT	**With Ballast**	**Without Ballast**
Rear Tires—No., size, ply & psi (kPa)	Four 20.8R42, **, 12 *(83)*	Two 20.8R42, **, 16 *(110)*
Ballast—Duals (total)	1950 lb *(885 kg)*	None
—Cast Iron (total)	2000 lb *(907 kg)*	None
Front Tires—No., size, ply & psi (kPa)	Two 16.9R30, ***, 24 *(165)*	Two 16.9R30, ***, 24 *(165)*
Ballast—Test Equip (total)	245 lb *(111 kg)*	None
—Cast Iron (total)	2100 lb *(953 kg)*	None
Height of Drawbar	20 in *(510 mm)*	19.0 in *(485 mm)*
Static Weight—Rear	15335 lb *(6956 kg)*	11830 lb *(5366 kg)*
—Front	9330 lb *(4232 kg)*	6540 lb *(2966 kg)*
—Total	24665 lb *(11188 kg)*	18370 lb *(8332 kg)*

THREE POINT HITCH PERFORMANCE (SAE Static Test)

Observed Maximum Pressure psi *(bar)*	2550 *(176)*
Location	remote outlet
Hydraulic oil temperature °F(°C)	124 *(51)*
Location	transmission sump
Category	III
Quick attach	Yes

Hitch point distance to ground level in *(mm)*	9.0 *(229)*	16.0 *(406)*	25.0 *(635)*	33.0 *(838)*	40.0 *(1016)*
Lift force on frame lb " " " " " " *(kN)*	9860 *(43.9)*	10570 *(47.0)*	10854 *(48.3)*	10224 *(45.5)*	9411 *(41.9)*
with 1-55 mm lift assist cylinder					
Hitch point distance to ground level in *(mm)*	9.0 *(229)*	16.0 *(406)*	25.0 *(635)*	33.0 *(838)*	40.0 *(1016)*
Lift force on frame lb " " " " " " *(kN)*	10518 *(46.8)*	11434 *(50.9)*	11576 *(51.5)*	10737 *(47.8)*	10041 *(44.7)*
with 2-44 mm lift assist cylinders					
Hitch point distance to ground level in *(mm)*	9.0 *(229)*	16.0 *(406)*	25.0 *(635)*	33.0 *(838)*	40.0 *(1016)*
Lift force on frame lb " " " " " " *(kN)*	11373 *(50.6)*	11972 *(53.3)*	12216 *(54.3)*	11617 *(51.7)*	10651 *(47.4)*
with 2-55 mm lift assist cylinders					
Hitch point distance to ground level in *(mm)*	9.1 *(231)*	16.0 *(406)*	25.0 *(635)*	33.0 *(838)*	40.0 *(1016)*
Lift force on frame lb " " " " " " *(kN)*	12534 *(55.8)*	13426 *(59.7)*	13720 *(61.0)*	12729 *(56.6)*	11773 *(52.4)*

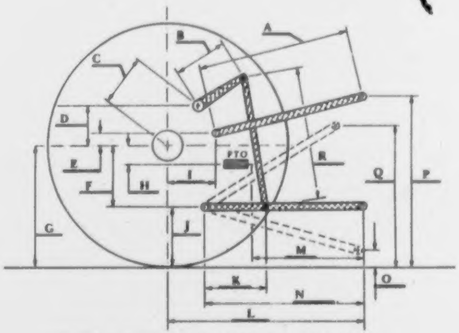
THREE POINT HITCH PERFORMANCE
(OECD Static Test)

CATEGORY: III
Quick Attach: Yes

Maximum Force Exerted Through Whole Range:	6614 lbs	*(29.4 kN)*
	*7057 lbs	*(31.4 kN)*
	**7486 lbs	*(33.3 kN)*
	***8274 lbs	*(36.8 kN)*
i) Opening pressure of relief valve:	NA	
Sustained pressure with pump stalled:	2550 psi	*(176 Bar)*
ii) Pump delivery rate at minimum pressure:	30.6 GPM	*(115.8 l/min)*
iii) Pump delivery rate at maximum hydraulic power:	29.6 GPM	*(112.0 l/min)*
Delivery pressure:	1750 psi	*(121 Bar)*
Power:	30.2 Hp	*(22.5 kW)*

*with 1-55 mm lift assist cylinder
**with 2-44 mm lift assist cylinders
***with 2-55 mm lift assist cylinders

John Deere 4955 Powershift Diesel



HITCH DIMENSIONS AS TESTED—NO LOAD

	inch	mm
A	28.1	*714*
B	18.4	*468*
C	12.9	*327*
D	12.9	*327*
E	6.8	*172*
F	13.0	*330*
G	36.1	*918*
H	7.0	*177*
I	15.1	*384*
J	23.1	*588*
K	28.2	*716*
L	44.3	*1124*
L'	49.3	*1251*
M	22.3	*565*
N	38.1	*968*
O	10.1	*257*
P	45.1	*1146*
Q	42.5	*1080*
R	37.3	*946*

L' to end of Quick Attach

Agricultural Research Division
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Darrell Nelson, Dean and Director

NEBRASKA OECD TRACTOR TEST 1629—SUMMARY 067
JOHN DEERE 4555 QUADRANGE DIESEL
ALSO JOHN DEERE 4560 QUADRANGE DIESEL
16 SPEED

POWER TAKE-OFF PERFORMANCE

Power HP (kW)	Crank shaft speed rpm	Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Mean Atmospheric Conditions
MAXIMUM POWER AND FUEL CONSUMPTION					
Rated Engine Speed—(PTO speed—998 rpm)					
156.83 (116.95)	2200	9.01 (34.11)	0.397 (0.241)	17.41 (3.43)	
Maximum Power (2 Hours)					
162.53 (121.20)	1950	8.90 (33.67)	0.378 (0.230)	18.27 (3.60)	Air temperature
VARYING POWER AND FUEL CONSUMPTION					
156.83 (116.95)	2200	9.01 (34.11)	0.397 (0.241)	17.41 (3.43)	75°F (24°C)
137.16 (102.28)	2264	8.16 (30.90)	0.411 (0.250)	16.80 (3.31)	Relative humidity
104.51 (77.93)	2299	6.73 (25.47)	0.445 (0.271)	15.53 (3.06)	56%
70.77 (52.77)	2331	5.30 (20.05)	0.517 (0.315)	13.36 (2.63)	Barometer
35.65 (26.59)	2358	3.91 (14.79)	0.757 (0.461)	9.12 (1.80)	28.89" Hg (97.84 kPa)
1.29 (0.96)	2388	2.52 (9.53)	13.501 (8.212)	0.51 (0.10)	

Maximum Torque 505 lb.-ft. *(684 Nm)* at 1451 rpm
Maximum Torque Rise 35%
Torque Rise at 1000 engine rpm 24%

DRAWBAR PERFORMANCE
FUEL CONSUMPTION CHARACTERISTICS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp. °F (°C) cooling med	Temp. °F (°C) Air dry bulb	Barom. inch Hg (kPa)
Maximum Power—8th (C2) Gear									
139.99 (104.39)	7885 (35.07)	6.66 (10.72)	2200	4.36	0.443 (0.270)	15.55 (3.06)	185 (85)	70 (21)	28.90 (97.87)
75% of Pull at Maximum Power—8th (C2) Gear									
110.08 (82.09)	5914 (26.31)	6.98 (11.23)	2275	3.01	0.475 (0.289)	14.53 (2.86)	182 (83)	75 (24)	28.89 (97.83)
50% of Pull at Maximum Power—8th (C2) Gear									
75.39 (56.22)	3947 (17.55)	7.16 (11.53)	2311	2.15	0.542 (0.330)	12.75 (2.51)	180 (82)	75 (24)	28.89 (97.83)
75% of Pull at Reduced Engine Speed—10th (D1) Gear									
110.17 (82.15)	5918 (26.32)	6.98 (11.24)	1702	3.01	0.442 (0.269)	15.65 (3.08)	183 (84)	75 (24)	28.89 (97.83)
50% of Pull at Reduced Engine Speed—10th (D1) Gear									
75.17 (56.05)	3936 (17.51)	7.16 (11.53)	1611	2.15	0.483 (0.294)	14.31 (2.82)	179 (81)	75 (24)	28.89 (97.83)

Location of Test: Center for Agricultural Equipment, Lincoln Nebraska 68583-0832, U.S.A.

Dates of Test: September-October, 1989

Manufacturer: John Deere Waterloo Works, P.O. Box 3500, Waterloo, Iowa 50704

FUEL OIL and TIME: Fuel No. 2 Diesel **Cetane No.** 51.1 **Specific gravity converted to 60°/60°F** *(15°/15°C)* 0.8300 **Fuel weight** 6.910 lbs/gal *(0.828 kg/l)* **Oil SAE** 15W40 **API service classification** CD/SD **To motor** 4.823 gal *(18.257 l)* **Drained from motor** 4.598 gal *(17.406 l)* **Transmission and hydraulic lubricant** John Deere HyGard fluid **Total time engine was operated** 25.0 hours.

ENGINE: Make John Deere Diesel **Type** six cylinder vertical with turbocharger **Serial No.** *RG6076T100007* **Crankshaft** lengthwise **Rated engine speed** 2200 **Bore and stroke** (as specified) 4.56" × 4.75" *(115.8 mm × 120.7 mm)* **Compression ratio** 16.0 to 1 **Displacement** 466 cu in *(7634 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements **Oil filter** one full flow cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** one paper cartridge and prefilter **Muffler** vertical **Cooling medium temperature control** 2 thermostats and variable speed fan.

ENGINE OPERATING PARAMETERS: Fuel rate 59.9-65.4 lb/hr *(27.2-29.7 kg/hr)* **High idle** 2350-2400 rpm **Turbo boost** nominal 15-18 psi *(103-124 kPa)* as measured 17.0 psi *(117 kPa)*.

CHASSIS: Type standard **Serial No.** *RW4555H001833* **Tread width** rear 62.0" *(1574 mm)* to 115.7" *(2938 mm)* front 61.0" *(1550 mm)* to 85.0" *(2160 mm)* **Wheel base** 118.5" *(3010 mm)* **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with partial (2) range operator controlled powershift **Nominal travel speeds mph (km/h)** first 2.11 *(3.39)* second 2.67 *(4.30)* third 3.80 *(6.12)* fourth 4.71 *(7.58)* fifth 4.83 *(7.78)* sixth 5.53 *(8.90)* seventh 5.97 *(9.62)* eighth 7.02 *(11.30)* ninth 8.50 *(13.69)* tenth 8.95 *(14.42)* eleventh 9.99 *(16.08)* twelfth 10.80 *(17.39)* thirteenth 11.37 *(18.31)* fourteenth 12.68 *(20.42)* fifteenth 16.19 *(26.07)* sixteenth 20.56 *(33.10)* reverse 3.97 *(6.39)*, 5.04 *(8.11)*, 8.87 *(14.28)*, 10.42 *(16.78)*, 11.26 *(18.14)*, 13.23 *(21.31)* **Clutch** multiple wet disc hydraulically power actuated by foot pedal **Brakes** multiple wet disc hydraulically power actuated by two foot pedals which can be locked together **Steering** hydrostatic **Power take-off** 998 rpm at 2200 engine rpm **Unladen tractor mass** 15840 lb *(7185 kg)*.

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

DRAWBAR PERFORMANCE AT 1950 RPM
MAXIMUM POWER IN SELECTED GEARS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp. °F (°C) cooling med	Temp. °F (°C) Air dry bulb	Barom. inch Hg (kPa)
3rd (A3) Gear									
115.40 (86.05)	13035 (57.98)	3.32 (5.34)	2264	14.35	0.509 (0.310)	13.58 (2.67)	182 (83)	57 (14)	28.92 (97.93)
4th (B1) Gear									
136.10 (101.49)	11719 (52.13)	4.36 (7.01)	2198	6.64	0.458 (0.279)	15.09 (2.97)	183 (84)	64 (18)	28.90 (97.87)
5th (A4) Gear									
137.16 (102.28)	11954 (53.17)	4.30 (6.92)	2151	7.96	0.452 (0.275)	15.28 (3.01)	184 (84)	66 (19)	28.90 (97.87)
6th (C1) Gear									
138.57 (103.33)	11077 (49.27)	4.69 (7.55)	2020	6.79	0.447 (0.272)	15.46 (3.05)	187 (86)	67 (19)	28.90 (97.87)
7th (B2) Gear									
142.01 (105.90)	10866 (48.33)	4.90 (7.89)	1950	6.71	0.434 (0.264)	15.93 (3.14)	188 (86)	69 (21)	28.90 (97.87)
8th (C2) Gear									
143.04 (106.67)	9161 (40.75)	5.86 (9.42)	1952	5.27	0.430 (0.262)	16.07 (3.16)	187 (86)	69 (21)	28.90 (97.87)
9th (B3) Gear									
141.02 (105.16)	7373 (32.79)	7.17 (11.54)	1948	3.94	0.435 (0.265)	15.88 (3.13)	187 (86)	70 (21)	28.90 (97.87)
10th (D1) Gear									
141.15 (105.24)	6985 (31.07)	7.58 (12.19)	1949	3.77	0.437 (0.266)	15.83 (3.12)	187 (86)	72 (22)	28.90 (97.87)
11th (C3) Gear									
141.17 (105.27)	6235 (27.73)	8.49 (13.66)	1949	3.27	0.435 (0.265)	15.88 (3.13)	187 (86)	72 (22)	28.90 (97.87)

DRAWBAR PERFORMANCE AT 1950 RPM
MAXIMUM POWER IN SELECTED GEARS—BALLASTED TRACTOR

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp. °F (°C) cooling med	Temp. °F (°C) Air dry bulb	Barom. inch Hg (kPa)
1st (A1) Gear									
89.02 (66.38)	17784 (79.10)	1.88 (3.02)	2299	13.70	0.541 (0.329)	12.77 (2.52)	180 (82)	56 (13)	29.08 (98.48)
2nd (A2) Gear									
110.66 (82.52)	17681 (78.65)	2.35 (3.78)	2260	14.17	0.510 (0.310)	13.56 (2.67)	181 (83)	53 (12)	29.08 (98.48)
3rd (A3) Gear									
140.21 (104.56)	15808 (70.32)	3.33 (5.35)	2077	6.59	0.445 (0.270)	15.51 (3.06)	185 (85)	60 (16)	29.08 (98.48)
4th (B1) Gear									
142.79 (106.48)	13441 (59.79)	3.98 (6.41)	1979	5.14	0.433 (0.263)	15.95 (3.14)	187 (86)	64 (18)	29.08 (98.48)
5th (A4) Gear									
144.37 (107.66)	13440 (59.78)	4.03 (6.48)	1951	5.14	0.426 (0.259)	16.23 (3.20)	187 (86)	65 (18)	29.08 (98.48)
6th (C1) Gear									
142.36 (106.16)	11460 (50.97)	4.66 (7.50)	1953	4.23	0.434 (0.264)	15.93 (3.14)	187 (86)	66 (19)	29.09 (98.51)
7th (B2) Gear									
146.25 (109.06)	10897 (48.47)	5.03 (8.10)	1947	4.06	0.422 (0.256)	16.39 (3.23)	188 (86)	67 (19)	29.09 (98.51)
8th (C2) Gear									
145.89 (108.79)	9159 (40.74)	5.97 (9.61)	1955	3.39	0.419 (0.255)	16.48 (3.25)	188 (87)	71 (22)	29.09 (98.51)
9th (B3) Gear									
142.95 (106.60)	7370 (32.78)	7.27 (11.71)	1949	2.70	0.430 (0.261)	16.07 (3.17)	189 (87)	73 (23)	29.07 (98.44)
10th (D1) Gear									
141.94 (105.85)	6945 (30.89)	7.66 (12.34)	1948	2.53	0.431 (0.262)	16.05 (3.16)	189 (87)	74 (23)	29.06 (98.41)
11th (C3) Gear									
142.39 (106.18)	6219 (27.66)	8.59 (13.82)	1950	2.27	0.433 (0.263)	15.96 (3.14)	189 (87)	74 (23)	29.05 (98.37)

REMARKS: All test results were determined from observed data obtained in accordance with official OECD, SAE and Nebraska test procedures. For the maximum power tests, the fuel temperature at the injection pump return was maintained at 125° F *(52° C)*. This tractor is equipped with a variable speed cooling fan. Since engine power is influenced by fan speed, all power tests were conducted at approximately the same ambient air temperatures. This tractor did not meet manufacturers 3 point lift capacity claim of 8870 lb *(4023 kg)* or 9710 lb *(4404 kg)* with lift assist cylinder. The performance figures on this summary were taken from a test conducted under the OECD restricted standard test code procedure.

Report reissued. Supplemental sales permit for John Deere 4560 Quad-range Diesel, November, 1991.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1629**, Summary 067, December 22, 1989.

LOUIS I. LEVITICUS
Engineer-in-Charge

K. VON BARGEN
R. D. GRISSO
L. L. BASHFORD
Board of Tractor Test Engineers

DRAWBAR PERFORMANCE AT 2200 RPM
MAXIMUM POWER IN SELECTED GEARS—BALLASTED TRACTOR

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp °F (°C) cool-ing med	Temp °F (°C) Air dry bulb	Barom. inch Hg (kPa)
				2nd (A2) Gear					
110.49 *(82.39)*	17774 *(79.06)*	2.33 *(3.75)*	2268	14.71	0.511 *(0.311)*	13.51 *(2.66)*	181 *(83)*	51 *(11)*	29.08 *(98.48)*
				3rd (A3) Gear					
138.94 *(103.61)*	14637 *(65.11)*	3.56 *(5.73)*	2198	5.55	0.449 *(0.273)*	15.39 *(3.03)*	184 *(84)*	58 *(14)*	29.08 *(98.48)*
				4th (B1) Gear					
139.85 *(104.27)*	11725 *(52.16)*	4.47 *(7.20)*	2202	4.91	0.444 *(0.270)*	15.56 *(3.06)*	186 *(86)*	63 *(17)*	29.08 *(98.48)*
				5th (A4) Gear					
140.72 *(104.94)*	11488 *(51.10)*	4.59 *(7.39)*	2205	4.23	0.440 *(0.267)*	15.72 *(3.10)*	185 *(85)*	64 *(18)*	29.08 *(98.48)*
				6th (C1) Gear					
139.96 *(104.37)*	9932 *(44.18)*	5.28 *(8.50)*	2200	3.56	0.445 *(0.270)*	15.54 *(3.06)*	186 *(85)*	65 *(18)*	29.08 *(98.48)*
				7th (B2) Gear					
141.77 *(105.72)*	9291 *(41.33)*	5.72 *(9.21)*	2199	3.39	0.441 *(0.268)*	15.66 *(3.09)*	186 *(86)*	68 *(20)*	29.09 *(98.51)*
				8th (C2) Gear					
141.47 *(105.49)*	7848 *(34.91)*	6.76 *(10.88)*	2198	2.79	0.439 *(0.267)*	15.74 *(3.10)*	186 *(86)*	70 *(21)*	29.09 *(98.51)*
				9th (B3) Gear					
138.52 *(103.29)*	6309 *(28.06)*	8.23 *(13.25)*	2198	2.27	0.449 *(0.273)*	15.40 *(3.03)*	187 *(86)*	72 *(22)*	29.08 *(98.48)*

TRACTOR SOUND LEVEL WITH CAB	dB(A)
Gear closest to 4.7 mph *(7.5 km/h)*—4th (B1) Gear	76.0
Maximum sound level	76.0
Transport speed—no load—16th (D4) Gear	77.0
Bystander in 16th (D4) Gear	85.0

LUGGING ABILITY IN 7th (B2) GEAR

Crankshaft Speed rpm	2199	1981	1764	1540	1325	1101
Pull—lbs *(kN)*	9291 *(41.33)*	10682 *(47.52)*	11760 *(52.31)*	12708 *(56.53)*	12640 *(56.23)*	12244 *(54.46)*
Increase in Pull %	0	15	27	37	36	32
Power—Hp *(kW)*	141.77 *(105.72)*	145.91 *(108.80)*	142.40 *(106.18)*	133.64 *(99.66)*	114.29 *(85.23)*	92.21 *(68.76)*
Speed—Mph *(km/h)*	5.72 *(9.21)*	5.12 *(8.24)*	4.54 *(7.31)*	3.94 *(6.35)*	3.39 *(5.46)*	2.82 *(4.55)*
Slip %	3.39	3.89	4.56	4.89	4.73	4.73

THREE POINT HITCH PERFORMANCE (SAE Static Test)

Observed Maximum Pressure psi *(bar)*	2580 *(178)*
Location	remote outlet
Hydraulic oil temperature °F(°C)	138 *(59)*
Location	transmission sump
Category	III
Quick attach	Yes

Hitch point distance to ground level in. *(mm)*	9.0 *(229)*	16.0 *(406)*	25.0 *(635)*	33.0 *(838)*	40.0 *(1016)*
Lift force on frame lb " " " " " " *(kN)*	8700 *(38.7)*	9228 *(41.0)*	9432 *(42.0)*	8944 *(39.8)*	8283 *(36.8)*
		with 1-44 mm lift assist cylinder			
Hitch point distance to ground level in. *(mm)*	9.0 *(229)*	16.0 *(406)*	25.0 *(635)*	33.0 *(838)*	40.0 *(1016)*
Lift force on frame lb " " " " " " *(kN)*	9860 *(43.9)*	10570 *(47.0)*	10854 *(48.3)*	10224 *(45.5)*	9411 *(41.9)*
		with 1-55 mm lift assist cylinder			
Hitch point distance to ground level in. *(mm)*	9.0 *(229)*	16.0 *(406)*	25.0 *(635)*	33.0 *(838)*	40.0 *(1016)*
Lift force on frame lb " " " " " " *(kN)*	10518 *(46.8)*	11454 *(50.9)*	11576 *(51.5)*	10757 *(47.8)*	10041 *(44.7)*

TIRES AND WEIGHT	With Ballast	Without Ballast
Rear Tires—No., size, ply & psi *(kPa)*	Four 18.4R42, **, 16 *(110)*	Two 18.4R42, **, 22 *(150)*
Ballast—Duals (total)	1710 lb *(776 kg)*	None
—Cast Iron (total)	1000 lb *(454 kg)*	None
Front Tires—No., size, ply & psi *(kPa)*	Two 14L-16.1, 10, 44 *(305)*	Two 14L-16.1, 10, 44 *(305)*
Ballast—Liquid (total)	None	None
—Test Equip (total)	195 lb *(88 kg)*	None
Height of Drawbar	24 in *(610 mm)*	23.5 in *(597 mm)*
Static Weight—Rear	13930 lb *(6319 kg)*	11020 lb *(4999 kg)*
—Front	4815 lb *(2184 kg)*	4820 lb *(2186 kg)*
—Total	18745 lb *(8503 kg)*	15840 lb *(7185 kg)*

THREE POINT HITCH PERFORMANCE
(OECD Static Test)

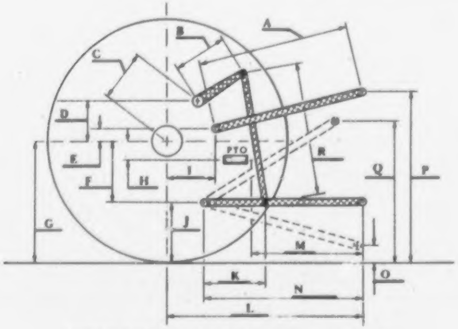
CATEGORY: III

Quick Attach: Yes

Maximum Force Exerted Through Whole Range	5821 lbs	*(25.9 kN)*
	*6614 lbs	*(29.4 kN)*
	**7057 lbs	*(31.4 kN)*
i) Opening pressure of relief valve	NA	
Sustained pressure with pump stalled	2580 psi	*(178 Bar)*
ii) Pump delivery rate at minimum pressure	35.3 GPM	*(133.6 l/min)*
iii) Pump delivery rate at maximum hydraulic power	33.9 GPM	*(128.3 l/min)*
Delivery pressure	1750 psi	*(121 Bar)*
Power	34.6 Hp	*(25.8 kW)*

*with 44 mm lift assist cylinder

**with 55 mm lift assist cylinder



HITCH DIMENSIONS AS TESTED—NO LOAD

	inch	mm
A	28.1	*714*
B	18.4	*468*
C	12.9	*327*
D	12.9	*327*
E	6.8	*172*
F	13.0	*330*
G	35.1	*892*
H	7.0	*177*
I	15.1	*384*
J	22.1	*562*
K	28.2	*716*
L	44.3	*1124*
L'	49.3	*1251*
M	22.3	*565*
N	38.1	*968*
O	9.1	*231*
P	44.1	*1121*
Q	41.5	*1053*
R	37.3	*946*

L' to end of Quick Attach

John Deere 4555 Quadrange Diesel

Agricultural Research Division
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Darrell Nelson, Dean and Director

NEBRASKA OECD TRACTOR TEST 1630—SUMMARY 068
JOHN DEERE 4755 QUADRANGE DIESEL
ALSO JOHN DEERE 4760 QUADRANGE DIESEL
16 SPEED

POWER TAKE-OFF PERFORMANCE

Power HP (kW)	Crank shaft speed rpm	Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Mean Atmospheric Conditions
MAXIMUM POWER AND FUEL CONSUMPTION					
Rated Engine Speed—(PTO speed—998 rpm)					
177.11 (132.07)	2200	9.75 (36.92)	0.379 (0.231)	18.21 (3.59)	
Maximum Power (2 Hours)					
180.35 (134.49)	2000	9.55 (36.17)	0.366 (0.223)	18.88 (3.72)	Air temperature
VARYING POWER AND FUEL CONSUMPTION					
177.11 (132.07)	2200	9.75 (36.92)	0.379 (0.231)	18.21 (3.59)	75°F (24°C)
154.31 (115.07)	2255	8.77 (33.20)	0.395 (0.239)	17.60 (3.47)	Relative humidity
116.72 (87.03)	2281	7.25 (27.45)	0.429 (0.261)	16.10 (3.17)	56%
79.32 (59.15)	2317	5.51 (20.87)	0.480 (0.292)	14.39 (2.83)	Barometer
40.11 (29.91)	2351	3.99 (15.12)	0.688 (0.419)	10.04 (1.98)	28.90" Hg (97.87 kPa)
0.77 (0.58)	2385	2.39 (9.04)	21.356 (12.990)	0.32 (0.06)	

Maximum Torque 575 lb.-ft (779 Nm) at 1400 rpm
Maximum Torque Rise 35.9%
Torque Rise at 1000 engine rpm 14%

DRAWBAR PERFORMANCE
FUEL CONSUMPTION CHARACTERISTICS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp °F (°C) cool-ing med	Temp °F (°C) Air dry bulb	Barom. inch Hg (kPa)
Maximum Power—8th (C2) Gear									
156.97 (117.05)	8441 (37.55)	6.97 (11.22)	2196	3.44	0.422 (0.257)	16.37 (3.22)	186 (86)	58 (14)	29.27 (99.12)
75% of Pull at Maximum Power—8th (C2) Gear									
122.77 (91.55)	6325 (28.13)	7.28 (11.72)	2256	2.28	0.448 (0.272)	15.43 (3.04)	185 (85)	69 (21)	29.21 (98.92)
50% of Pull at Maximum Power—8th (C2) Gear									
84.01 (62.65)	4223 (18.78)	7.46 (12.00)	2304	1.47	0.516 (0.314)	13.40 (2.64)	180 (82)	69 (21)	29.21 (98.92)
75% of Pull at Reduced Engine Speed—10th (D1) Gear									
123.00 (91.72)	6332 (28.17)	7.28 (11.72)	1777	2.19	0.425 (0.259)	16.25 (3.20)	185 (85)	69 (21)	29.20 (98.88)
50% of Pull at Reduced Engine Speed—10th (D1) Gear									
84.10 (62.71)	4232 (18.83)	7.45 (11.99)	1804	1.47	0.463 (0.282)	14.92 (2.94)	180 (82)	69 (21)	29.20 (98.88)

Location of Test: Center for Agricultural Equipment, Lincoln Nebraska 68583-0832, U.S.A.

Dates of Test: September-October, 1989

Manufacturer: John Deere Waterloo Works, P.O. Box 3500, Waterloo, Iowa 50704

FUEL OIL and TIME: Fuel No. 2 Diesel **Cetane No.** 51.1 **Specific gravity converted to 60°/60°F** *(15°/15°C)* 0.8300 **Fuel weight** 6.910 lbs/gal *(0.828 kg/l)* **Oil SAE** 15W40 **API service classification** CD/SD **To motor** 4.344 gal *(16.442 l)* **Drained from motor** 4.101 gal *(15.526 l)* **Transmission and hydraulic lubricant** John Deere HyGard fluid **Total time engine was operated** 19.0 hours.

ENGINE: Make John Deere Diesel **Type** six cylinder vertical with turbocharger and intercooler **Serial No.** *RG6076A109849* **Crankshaft** lengthwise **Rated engine speed** 2200 **Bore and stroke** (as specified) 4.56" × 4.75" *(115.8 mm × 120.7 mm)* **Compression ratio** 16.0 to 1 **Displacement** 466 cu in *(7634 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements **Oil filter** one full flow cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** one paper element and prefilter **Muffler** vertical **Cooling medium temperature control** 2 thermostats and variable speed fan.

ENGINE OPERATING PARAMETERS: Fuel rate 66.6-72.8 lb/hr *(30.2-33.0 kg/hr)* **High idle** 2350-2400 rpm **Turbo boost** nominal 16-19 psi *(110-131 kPa)* as measured 17.0 psi *(117 kPa)*.

CHASSIS: Type standard **Serial No.** *RW4755H001852* **Tread width** rear 64.6" *(1642 mm)* to 115.7" *(2938 mm)* front 61.0" *(1550 mm)* to 85.0" *(2160 mm)* **Wheel base** 118.5" *(3010 mm)* **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with partial (2) range operator controlled powershift **Nominal travel speeds mph (km/h)** first 2.17 *(3.49)* second 2.75 *(4.43)* third 3.91 *(6.30)* fourth 4.84 *(7.80)* fifth 4.97 *(8.00)* sixth 5.69 *(9.16)* seventh 6.15 *(9.90)* eighth 7.22 *(11.63)* ninth 8.75 *(14.09)* tenth 9.22 *(14.84)* eleventh 10.28 *(16.55)* twelfth 11.11 *(17.89)* thirteenth 11.71 *(18.85)* fourteenth 13.05 *(21.01)* fifteenth 16.66 *(26.83)* sixteenth 21.16 *(34.07)* reverse 4.09 *(6.58)*, 5.19 *(8.35)*, 9.13 *(14.70)*, 10.72 *(17.27)*, 11.59 *(18.67)*, 13.62 *(21.93)* **Clutch** multiple wet disc hydraulically power actuated by foot pedal **Brakes** multiple wet disc hydraulically power actuated by two foot pedals which can be locked together **Steering** hydrostatic **Power take-off** 998 rpm at 2200 engine rpm **Unladen tractor mass** 16030 lb *(7271 kg)*.

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

DRAWBAR PERFORMANCE AT 2000 RPM
MAXIMUM POWER IN SELECTED GEARS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp °F (°C) cool-ing med	Temp °F (°C) Air dry bulb	Barom. inch Hg (kPa)
3rd (A3) Gear									
127.37 (94.98)	13925 (61.94)	3.43 (5.52)	2240	14.94	0.491 (0.298)	14.09 (2.77)	182 (83)	52 (11)	29.27 (99.12)
4th (B1) Gear									
153.68 (114.60)	13005 (57.85)	4.43 (7.13)	2150	6.51	0.435 (0.265)	15.87 (3.13)	185 (85)	51 (11)	29.27 (99.12)
5th (A4) Gear									
153.19 (114.23)	12851 (57.16)	4.47 (7.19)	2134	7.33	0.434 (0.264)	15.90 (3.13)	185 (85)	54 (12)	29.27 (99.12)
6th (C1) Gear									
156.06 (116.37)	11485 (51.09)	5.10 (8.20)	2079	5.34	0.422 (0.257)	16.36 (3.22)	186 (85)	55 (13)	29.27 (99.12)
7th (B2) Gear									
158.91 (118.50)	11172 (49.70)	5.33 (8.58)	2008	4.02	0.415 (0.252)	16.66 (3.28)	186 (86)	56 (13)	29.27 (99.12)
8th (C2) Gear									
160.43 (119.63)	9540 (42.43)	6.31 (10.15)	1998	3.97	0.409 (0.249)	16.90 (3.33)	188 (86)	57 (14)	29.27 (99.12)
9th (B3) Gear									
158.10 (117.90)	7660 (34.08)	7.74 (12.46)	2005	3.00	0.416 (0.253)	16.60 (3.27)	188 (87)	59 (15)	29.27 (99.12)
10th (D1) Gear									
156.74 (116.88)	7212 (32.08)	8.15 (13.12)	1999	2.73	0.423 (0.257)	16.34 (3.22)	188 (86)	61 (16)	29.27 (99.12)

DRAWBAR PERFORMANCE AT 2000 RPM
MAXIMUM POWER IN SELECTED GEARS—BALLASTED TRACTOR

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp °F (°C) cool-ing med	Temp °F (°C) Air dry bulb	Barom. inch Hg (kPa)
2nd (A2) Gear									
131.94 (98.39)	19557 (86.99)	2.53 (4.07)	2246	10.25	0.468 (0.285)	14.77 (2.91)	183 (84)	64 (18)	28.88 (97.80)
3rd (A3) Gear									
152.56 (113.76)	15960 (70.99)	3.61 (5.81)	2126	4.92	0.438 (0.267)	15.77 (3.11)	187 (86)	72 (22)	28.87 (97.77)
4th (B1) Gear									
154.99 (115.57)	13261 (58.99)	4.38 (7.05)	2092	3.71	0.429 (0.261)	16.15 (3.18)	187 (86)	73 (23)	28.86 (97.73)
5th (A4) Gear									
157.60 (117.52)	13192 (58.68)	4.48 (7.21)	2055	3.62	0.422 (0.257)	16.38 (3.23)	188 (86)	74 (23)	28.86 (97.73)
6th (C1) Gear									
156.02 (116.34)	11653 (51.83)	5.02 (8.08)	2031	3.27	0.423 (0.257)	16.33 (3.22)	188 (86)	75 (24)	28.85 (97.70)
7th (B2) Gear									
159.37 (118.84)	10996 (48.91)	5.44 (8.75)	1999	2.91	0.412 (0.251)	16.76 (3.30)	189 (87)	75 (24)	28.85 (97.70)
8th (C2) Gear									
158.28 (118.03)	9239 (41.09)	6.43 (10.35)	2007	2.36	0.416 (0.253)	16.60 (3.27)	188 (86)	76 (24)	28.84 (97.66)
9th (B3) Gear									
155.16 (115.70)	7433 (33.06)	7.83 (12.60)	2002	1.98	0.424 (0.258)	16.31 (3.21)	189 (87)	77 (25)	28.83 (97.63)
10th (D1) Gear									
154.01 (114.84)	7000 (31.14)	8.25 (13.28)	2000	1.83	0.427 (0.260)	16.18 (3.19)	188 (87)	77 (25)	28.82 (97.60)

REMARKS: All test results were determined from observed data obtained in accordance with official OECD, SAE and Nebraska test procedures. For the maximum power tests, the fuel temperature at the injection pump return was maintained at 128° F *(53° C)*. This tractor is equipped with a variable speed cooling fan. Since engine power is influenced by fan speed, all power tests were conducted at approximately the same ambient air temperatures. This tractor did not meet manufacturers 3 point lift capacity claim of 8870 lb *(4023 kg)* or 9710 lb *(4404 kg)* with lift assist cylinder. The performance figures on this summary were taken from a test conducted under the OECD restricted standard test code procedure.

Report reissued. Supplemental sales permit for John Deere 4760 Quadrange Diesel, November, 1991.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1630**, Summary 068, December 22, 1989.

LOUIS I. LEVITICUS
Engineer-in-Charge

K. VON BARGEN
R. D. GRISSO
L. L. BASHFORD
Board of Tractor Test Engineers

DRAWBAR PERFORMANCE AT 2200 RPM
MAXIMUM POWER IN SELECTED GEARS—BALLASTED TRACTOR

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crankshaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temp °F (°C) cooling med	Air dry bulb	Barom. inch Hg (kPa)
				2nd (A2) Gear					
130.62 (97.41)	19898 (88.51)	2.46 (3.96)	2240	12.70	0.477 (0.290)	14.50 (2.86)	183 (84)	60 (16)	28.88 (97.80)
				3rd (A3) Gear					
152.18 (113.48)	15217 (67.69)	3.75 (6.04)	2201	4.58	0.441 (0.268)	15.66 (3.09)	186 (86)	72 (22)	28.87 (97.77)
				4th (B1) Gear					
152.87 (113.99)	12196 (54.25)	4.70 (7.56)	2201	3.27	0.437 (0.266)	15.82 (3.12)	186 (86)	72 (22)	28.87 (97.77)
				5th (A4) Gear					
154.97 (115.56)	12057 (53.63)	4.82 (7.76)	2200	3.27	0.432 (0.263)	16.00 (3.15)	187 (86)	74 (23)	28.86 (97.73)
				6th (C1) Gear					
154.15 (114.95)	10444 (46.46)	5.54 (8.91)	2197	2.92	0.436 (0.265)	15.85 (3.12)	188 (86)	74 (23)	28.85 (97.70)
				7th (B2) Gear					
155.88 (116.24)	9730 (43.28)	6.01 (9.67)	2201	2.75	0.429 (0.261)	16.09 (3.17)	187 (86)	75 (24)	28.84 (97.66)
				8th (C2) Gear					
155.95 (116.29)	8260 (36.74)	7.08 (11.40)	2198	2.28	0.429 (0.261)	16.10 (3.17)	187 (86)	75 (24)	28.84 (97.66)
				9th (B3) Gear					
151.98 (113.33)	6604 (29.38)	8.63 (13.89)	2202	1.83	0.441 (0.268)	15.60 (3.08)	187 (86)	77 (25)	28.83 (97.63)

TRACTOR SOUND LEVEL WITH CAB	dB(A)
Gear closest to 4.7 mph (7.5 km/h)—4th (B1) Gear	76.0
Maximum sound level	76.0
Transport speed—no load—16th (D4) Gear	76.5
Bystander in 16th (D4) Gear	86.5

LUGGING ABILITY IN 7th (B2) GEAR

Crankshaft Speed rpm	2201	1980	1762	1540	1320	1101
Pull—lbs (kN)	9730 (43.28)	11055 (49.18)	12225 (54.38)	13051 (58.05)	13300 (59.16)	12252 (54.50)
Increase in Pull %	0	14	26	34	37	26
Power—Hp (kW)	155.88 (116.24)	158.75 (118.38)	155.50 (116.03)	144.61 (107.83)	126.21 (94.11)	97.32 (72.57)
Speed—Mph (km/h)	6.01 (9.67)	5.38 (8.67)	4.77 (7.68)	4.16 (6.69)	3.56 (5.73)	2.98 (4.79)
Slip %	2.75	3.09	3.27	3.80	3.80	3.45

THREE POINT HITCH PERFORMANCE (SAE Static Test)

Observed Maximum Pressure psi (bar)	2560 (177)
Location	remote outlet
Hydraulic oil temperature °F(°C)	131 (55)
Location	transmission sump
Category	III
Quick attach	Yes

Hitch point distance to ground level in. (mm)	9.0 (229)	16.0 (406)	25.0 (635)	33.0 (838)	40.0 (1016)
Lift force on frame lb " " " " " " (kN)	8700 (38.7)	9220 (41.0)	9432 (42.0)	8944 (39.8)	8283 (36.8)
with 1-44 mm lift assist cylinder					
Hitch point distance to ground level in. (mm)	9.0 (229)	16.0 (406)	25.0 (635)	33.0 (838)	40.0 (1016)
Lift force on frame lb " " " " " " (kN)	9880 (43.9)	10570 (47.0)	10854 (48.3)	10224 (45.5)	9414 (41.9)
with 1-55 mm lift assist cylinder					
Hitch point distance to ground level in. (mm)	9.0 (229)	16.0 (406)	25.0 (635)	33.0 (838)	40.0 (1016)
Lift force on frame lb " " " " " " (kN)	10518 (46.8)	11434 (50.9)	11576 (51.5)	10737 (47.8)	10041 (44.7)

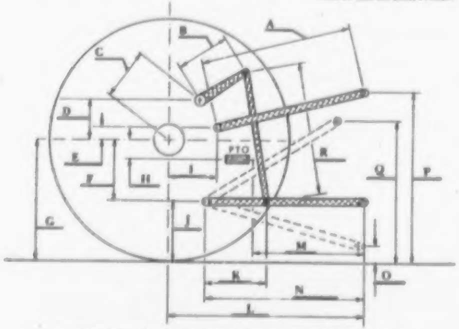
TIRES AND WEIGHT	With Ballast	Without Ballast
Rear Tires—No., size, ply & psi (kPa)	Four 20.8R42; **; 14 (95)	Two 20.8R42; **; 18 (125)
Ballast—Duals (total)	1950 lb (885 kg)	None
—Cast Iron (total)	2000 lb (907 kg)	None
Front Tires—No., size, ply & psi (kPa)	Two 14L-16.1; 10; 44 (305)	Two 14L-16.1; 10; 44 (305)
Ballast—Liquid (total)	None	None
—Test Equip (total)	560 lb (254 kg)	None
Height of Drawbar	22.5 in (570 mm)	25.5 in (650 mm)
Static Weight—Rear	15450 lb (7008 kg)	11165 lb (5064 kg)
—Front	4870 lb (2209 kg)	4865 lb (2207 kg)
—Total	20320 lb (9217 kg)	16030 lb (7271 kg)

THREE POINT HITCH PERFORMANCE
(OECD Static Test)

CATEGORY: III
Quick Attach: Yes

Maximum Force Exerted Through Whole Range	5371 lbs (23.9 kN) *6611 lbs (29.4 kN) **7057 lbs (31.4 kN)
i) Opening pressure of relief valve	NA
Sustained pressure with pump stalled	2560 psi (177 Bar)
ii) Pump delivery rate at minimum pressure	35.2 GPM (133.2 l/min)
iii) Pump delivery rate at maximum hydraulic power	33.7 GPM (127.6 l/min)
Delivery pressure	1750 psi (121 Bar)
Power	34.4 Hp (25.7 kW)

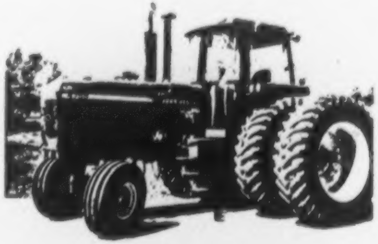
*with 44 mm lift assist cylinder
**with 55 mm lift assist cylinder



HITCH DIMENSIONS AS TESTED—NO LOAD

	inch	mm
A	28.1	714
B	18.4	468
C	12.9	327
D	12.9	327
E	6.8	172
F	13.0	330
G	36.1	918
H	7.0	177
I	15.1	384
J	23.1	588
K	28.2	716
L	44.3	1124
L'	49.3	1251
M	22.3	565
N	38.1	968
O	10.1	257
P	45.1	1146
Q	42.5	1080
R	37.3	946

L' to end of Quick Attach



John Deere 4755 Quadrange Diesel

Agricultural Research Division
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Darrell Nelson, Dean and Director

NEBRASKA OECD TRACTOR TEST 1642—SUMMARY 080
FORD 3230 8 x 2 DIESEL
8 SPEED

POWER TAKE-OFF PERFORMANCE

Power HP (kW)	Crank shaft speed rpm	Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Mean Atmospheric Conditions
MAXIMUM POWER AND FUEL CONSUMPTION					
Rated Engine Speed—(PTO speed—600 rpm)					
32.53 (24.11)	2000	2.11 (7.99)	0.457 (0.278)	15.31 (3.02)	
Standard PTO Speed (PTO—540 RPM)					
30.99 (23.11)	1800	1.95 (7.40)	0.441 (0.268)	15.85 (3.12)	Air temperature
VARYING POWER AND FUEL CONSUMPTION					
32.53 (24.11)	2000	2.11 (7.99)	0.457 (0.278)	15.31 (3.02)	75°F (24°C)
28.80 (21.47)	2100	1.97 (7.45)	0.479 (0.292)	14.59 (2.88)	Relative humidity
21.78 (16.24)	2117	1.72 (6.50)	0.551 (0.335)	12.66 (2.50)	60%
14.62 (10.90)	2130	1.37 (5.20)	0.657 (0.399)	10.65 (2.10)	Barometer
7.36 (5.49)	2145	1.12 (4.22)	1.060 (0.645)	6.60 (1.30)	29.06" Hg (98.40 kPa)
0.12 (0.09)	2167	0.92 (3.49)	46.056 (28.013)	0.13 (0.03)	

Maximum Torque 113 lb.-ft. (153 Nm) at 998 rpm
Maximum Torque Rise 32.6%

DRAWBAR PERFORMANCE
FUEL CONSUMPTION CHARACTERISTICS
(Front Drive Engaged)

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp. °F (°C) cool-ing med	Temp. °F (°C) Air dry bulb	Barom. inch Hg (kPa)
Maximum Power—5th (1H) Gear									
26.03 (19.41)	1584 (7.04)	6.16 (9.92)	2001	3.78	0.578 (0.351)	12.11 (2.39)	179 (82)	60 (16)	28.72 (97.26)
75% of Pull at Maximum Power—5th (1H) Gear									
20.67 (15.42)	1187 (5.28)	6.53 (10.51)	2112	3.36	0.651 (0.396)	10.75 (2.12)	176 (80)	53 (12)	28.85 (97.70)
50% of Pull at Maximum Power—5th (1H) Gear									
14.02 (10.46)	792 (3.52)	6.64 (10.69)	2128	2.14	0.800 (0.487)	8.71 (1.72)	180 (82)	53 (12)	28.85 (97.70)
75% of Pull at Reduced Engine Speed—6th (2H) Gear									
20.67 (15.42)	1189 (5.29)	6.52 (10.49)	1689	3.36	0.575 (0.350)	12.17 (2.40)	177 (81)	53 (12)	28.85 (97.70)
50% of Pull at Reduced Engine Speed—6th (2H) Gear									
14.00 (10.44)	792 (3.52)	6.63 (10.67)	1702	2.62	0.693 (0.421)	10.10 (1.99)	176 (80)	53 (12)	28.85 (97.70)

Location of Test: Tractor Testing Laboratory, University of Nebraska, Lincoln, Nebraska 68583-0832, U.S.A.

Dates of Test: April 9-25, 1991

Manufacturer: FORD NEW HOLLAND, 500 Diller Avenue, New Holland, PA 17557

FUEL OIL and TIME: Fuel No. 2 Diesel **Cetane No.** 53.9 **Specific gravity converted to 60°/60°F** *(15°/15°C)* 0.8300 **Fuel weight** 6.903 lbs/gal *(0.828 kg/l)* **Oil SAE** 15W-40 **API service classification** SG/CE **To motor** 1.127 gal *(4.266 l)* **Drained from motor** 1.007 gal *(3.813 l)* **Transmission and final drive lubricant** Ford M2C 134 D fluid **Front axle lubricant** Ford M2C 134 D fluid **Total time engine was operated** 21.5 hours

ENGINE: Make Ford Diesel **Type** three cylinder vertical **Serial No.** *B293617* **Crankshaft** lengthwise **Rated rpm** 2000 **Bore and stroke** (as specified) 4.4" × 4.2" *(111.8 mm × 106.7 mm)* **Compression ratio** 16.3 to 1 **Displacement** 192 cu in *(3142 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements **Oil filter** one full flow cartridge **Oil cooler** radiator for power steering fluid **Fuel filter** one paper element and sediment bowl **Muffler** vertical **Cooling medium temperature control** one thermostat

ENGINE OPERATING PARAMETERS: Fuel rate 14.5-16.5 lb/hr *(6.6-7.5 kg/hr)* **High idle** 2150-2200 rpm

CHASSIS: Type front wheel assist **Serial No.** *BC76439* **Tread width** rear 56.0" *(1423 mm)* to 79.8" *(2026 mm)* front 55.0" *(1396 mm)* to 73.0" *(1855 mm)* **Wheel base** 84.1" *(2136 mm)* **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Nominal travel speeds mph (km/h)** first 1.73 *(2.79)* second 2.16 *(3.48)* third 3.79 *(6.10)* fourth 5.16 *(8.30)* fifth 6.18 *(9.94)* sixth 7.71 *(12.41)* seventh 13.52 *(21.76)* eighth 18.49 *(29.75)* reverse 2.49 *(4.00)*, 8.80 *(14.30)* **Clutch** single dry disc operated by foot pedal **Brakes** wet multiple disc operated by two foot pedals which can be locked together **Steering** hydrostatic **Power take-off** 540 rpm at 1800 engine rpm **Unladen tractor mass** 5374 lb *(2438 kg)*

DRAWBAR PERFORMANCE
MAXIMUM POWER IN SELECTED GEARS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp. °F (°C) cool-ing med	Temp. °F (°C) Air dry bulb	Barom. inch Hg (kPa)
2nd (2L) Gear									
22.70 (16.93)	4275 (19.01)	2.00 (3.22)	2001	14.66	0.611 (0.372)	10.92 (2.15)	178 (81)	46 (8)	28.81 (97.56)
3rd (3L) Gear									
25.71 (19.17)	2637 (11.73)	3.66 (5.88)	2000	6.86	0.565 (0.344)	11.98 (2.36)	180 (82)	62 (17)	28.71 (97.22)
4th (4L) Gear									
25.80 (19.24)	1883 (8.38)	5.08 (8.18)	1998	4.67	0.584 (0.355)	11.88 (2.34)	177 (80)	55 (13)	28.74 (97.32)
5th (1H) Gear									
26.03 (19.41)	1584 (7.04)	6.16 (9.92)	2001	3.78	0.578 (0.351)	12.11 (2.39)	179 (82)	60 (16)	28.72 (97.26)
6th (2H) Gear									
21.91 (16.34)	1162 (5.17)	7.74 (12.45)	1996	2.09	0.600 (0.365)	11.65 (2.30)	180 (82)	67 (19)	28.69 (97.16)

DRAWBAR PERFORMANCE
FUEL CONSUMPTION CHARACTERISTICS
(Front Drive Disengaged)

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp. °F (°C) cool-ing med	Temp. °F (°C) Air dry bulb	Barom. inch Hg (kPa)
Maximum Power—5th (1H) Gear									
26.20 (19.54)	1659 (7.38)	5.92 (9.53)	2000	6.66	0.575 (0.350)	12.15 (2.39)	175 (79)	58 (14)	28.72 (97.26)
75% of Pull at Maximum Power—5th (1H) Gear									
21.06 (15.70)	1246 (5.54)	6.34 (10.20)	2112	5.26	0.636 (0.387)	11.00 (2.17)	180 (82)	56 (13)	28.84 (97.66)
50% of Pull at Maximum Power—5th (1H) Gear									
14.01 (10.45)	833 (3.71)	6.49 (10.44)	2128	3.71	0.775 (0.471)	9.02 (1.78)	177 (80)	56 (13)	28.84 (97.66)
75% of Pull at Reduced Engine Speed—6th (2H) Gear									
21.03 (15.68)	1242 (5.52)	6.35 (10.22)	1695	5.20	0.566 (0.344)	12.35 (2.43)	175 (79)	56 (13)	28.84 (97.66)
50% of Pull at Reduced Engine Speed—6th (2H) Gear									
14.15 (10.55)	832 (3.70)	6.51 (10.48)	1711	3.74	0.666 (0.405)	10.19 (2.01)	174 (79)	56 (13)	28.84 (97.66)

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with official OECD, SAE and Nebraska test procedures. For the maximum power tests, the fuel temperature at the injection pump was maintained at 135°F (57°C). The performance figures on this summary were taken from a test conducted under the OECD Code II restricted standard test code procedure.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1642**, Summary 080, July 15, 1991.

LOUIS I. LEVITICUS
Engineer-in-Charge

K. VON BARGEN
R. D. GRISSO
G. J. HOFFMAN
Board of Tractor Test Engineers

DRAWBAR PERFORMANCE
MAXIMUM POWER IN SELECTED GEARS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp °F (°C) cooling med	Temp °F (°C) Air dry bulb	Barom. inch Hg (kPa)
				2nd (2L) Gear					
15.35 *(11.45)*	2883 *(12.82)*	2.00 *(3.21)*	2120	14.90	0.746 *(0.454)*	9.38 *(1.85)*	175 *(79)*	49 *(9)*	28.85 *(97.70)*
				3rd (3L) Gear					
24.52 *(18.28)*	2770 *(12.32)*	3.32 *(5.34)*	2001	14.57	0.614 *(0.374)*	11.39 *(2.24)*	180 *(82)*	64 *(18)*	28.70 *(97.19)*
				4th (4L) Gear					
25.71 *(19.17)*	1984 *(8.82)*	4.86 *(7.82)*	2003	8.11	0.584 *(0.355)*	11.97 *(2.36)*	178 *(81)*	56 *(13)*	28.73 *(97.29)*
				5th (1H) Gear					
26.20 *(19.54)*	1659 *(7.38)*	5.92 *(9.53)*	2000	6.46	0.575 *(0.350)*	12.15 *(2.39)*	175 *(79)*	58 *(14)*	28.72 *(97.26)*
				6th (2H) Gear					
25.64 *(19.12)*	1284 *(5.71)*	7.49 *(12.06)*	1999	5.20	0.588 *(0.358)*	11.90 *(2.34)*	179 *(82)*	65 *(18)*	28.70 *(97.19)*

TIRES AND WEIGHT	**Tested Without Ballast**
Rear Tires—No., size, ply & psi *(kPa)*	Two 13.6-28; 6; 14 *(97)*
Front Tires—No., size, ply & psi *(kPa)*	Two 8.3-24; 4; 16 *(110)*
Height of Drawbar	15.0 in *(381 mm)*
Static Weight with Operator—*Rear*	3324 lbs *(1508 kg)*
—*Front*	2214 lbs *(1004 kg)*
—*Total*	5538 lbs *(2512 kg)*

THREE POINT HITCH PERFORMANCE (SAE Static Test)

Observed Maximum Pressure psi *(bar)*	2600 *(179)*
Location	remote outlet
Hydraulic oil temperature °F(°C)	169 *(76)*
Location	rear axle sump
Category	I
Quick attach	none

Hitch point distance to ground level in. *(mm)*	8.3 *(211)*	13.0 *(330)*	17.7 *(450)*	22.4 *(569)*	27.2 *(691)*	32.1 *(815)*
Lift force on frame lb *(kN)*	3271 *(14.5)*	3589 *(16.0)*	3772 *(16.8)*	3791 *(16.9)*	3676 *(16.3)*	3473 *(15.4)*

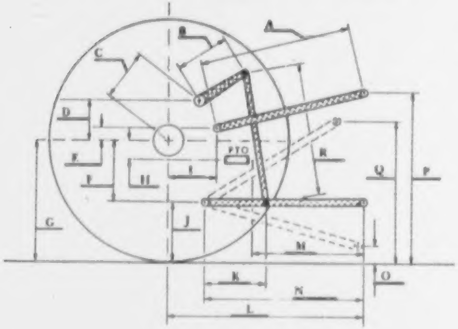
THREE POINT HITCH PERFORMANCE
(OECD Static Test)

CATEGORY: I

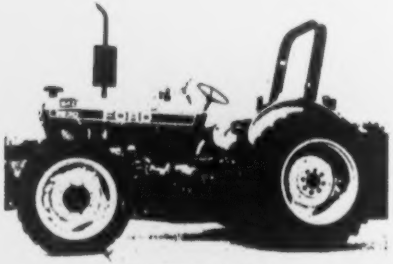
Quick Attach: none

Maximum Force Exerted Through Whole Range	3056 lbs	*(13.6 kN)*
i) Opening pressure of relief valve	N.A.	
Sustained pressure of the open relief valve	2610 psi	*(180 bar)*
ii) Pump delivery rate at minimum pressure	8.0 GPM	*(30.3 l/min)*
iii) Pump delivery rate at maximum hydraulic power	6.1 GPM	*(23.1 l/min)*
Delivery pressure	2400 psi	*(165 bar)*
Power	8.5 HP	*(6.4 kW)*

HITCH DIMENSIONS AS TESTED—NO LOAD



	inch	mm
A	28.3	*719*
B	10.0	*254*
C	12.9	*327*
D	10.1	*257*
E	7.5	*191*
F	8.0	*203*
G	24.0	*610*
H	4.7	*120*
I	8.7	*222*
J	16.0	*407*
K	18.9	*481*
L	36.7	*931*
M	20.9	*530*
N	34.0	*864*
O	8.0	*203*
P	34.1	*867*
Q	33.1	*841*
R	29.1	*740*



Ford 3230 8 x 2 Diesel

Agricultural Research Division
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Darrell Nelson, Dean and Director

NEBRASKA OECD TRACTOR TEST 1643—SUMMARY 081
FORD 3430 8 x 2 DIESEL
8 SPEED

POWER TAKE-OFF PERFORMANCE

Power HP (kW)	Crank shaft speed rpm	Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Mean Atmospheric Conditions
MAXIMUM POWER AND FUEL CONSUMPTION					
Rated Engine Speed—(PTO speed—600 rpm)					
38.48 (28.70)	2000	2.55 (9.63)	0.463 (0.282)	15.11 (2.98)	
Standard PTO Speed (PTO—540 RPM)					
36.92 (27.53)	1800	2.38 (9.00)	0.450 (0.274)	15.53 (3.06)	
VARYING POWER AND FUEL CONSUMPTION					Air temperature
38.48 (28.70)	2000	2.55 (9.63)	0.463 (0.282)	15.11 (2.98)	75°F (24°C)
33.85 (25.24)	2076	2.23 (8.44)	0.461 (0.280)	15.17 (2.99)	Relative humidity
25.87 (19.29)	2109	1.89 (7.15)	0.510 (0.310)	13.71 (2.70)	41%
17.36 (12.94)	2124	1.50 (5.68)	0.605 (0.368)	11.56 (2.28)	Barometer
8.83 (6.58)	2147	1.12 (4.22)	0.883 (0.537)	7.92 (1.56)	28.92" Hg (97.93 kPa)
0.12 (0.09)	2170	0.82 (3.09)	45.985 (27.972)	0.15 (0.03)	

Maximum Torque 121 lb.-ft. (165 Nm) at 1152 rpm
Maximum Torque Rise 20.0%

DRAWBAR PERFORMANCE
FUEL CONSUMPTION CHARACTERISTICS
(Front Drive Engaged)

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp °F (°C) cooling med	Temp °F (°C) Air dry bulb	Barom. inch Hg (kPa)
Maximum Power—5th (1H) Gear									
31.66 (23.61)	1950 (8.67)	6.09 (9.80)	2001	4.65	0.558 (0.339)	12.54 (2.47)	183 (84)	53 (12)	28.78 (97.46)
75% of Pull at Maximum Power—5th (1H) Gear									
24.91 (18.57)	1463 (6.51)	6.38 (10.28)	2081	3.91	0.597 (0.363)	11.72 (2.31)	182 (83)	47 (8)	29.02 (98.27)
50% of Pull at Maximum Power—5th (1H) Gear									
16.90 (12.60)	973 (4.33)	6.51 (10.48)	2101	2.85	0.719 (0.437)	9.85 (1.94)	180 (82)	47 (8)	29.02 (98.27)
75% of Pull at Reduced Engine Speed—4th (2H) Gear									
24.92 (18.58)	1467 (6.53)	6.37 (10.25)	1664	3.91	0.548 (0.333)	12.76 (2.51)	180 (82)	47 (8)	29.02 (98.27)
50% of Pull at Reduced Engine Speed—4th (2H) Gear									
16.90 (12.60)	974 (4.33)	6.51 (10.47)	1682	3.03	0.626 (0.381)	11.17 (2.20)	177 (80)	47 (8)	29.02 (98.27)

Location of Test: Tractor Testing Laboratory, University of Nebraska, Lincoln Nebraska 68583-0832, U.S.A.

Dates of Test: April 16-25, 1991

Manufacturer: FORD NEW HOLLAND, 500 Diller Avenue, New Holland PA 17557

FUEL OIL and TIME: Fuel No. 2 Diesel **Cetane No.** 53.9 **Specific gravity converted to 60°/60 F** *(15°/15°C)* 0.8399 **Fuel weight** 6.993 lbs/gal *(0.838 kg/l)* **Oil SAE** 15W-40 **API service classification** SG/CE **To motor** 1.161 gal *(4.406 l)* **Drained from motor** 1.061 gal *(4.015 l)* **Transmission and final drive lubricant** Ford M2C 134-D fluid **Front axle lubricant** Ford M2C 134-D fluid **Total time engine was operated** 15.0 hours

ENGINE: Make Ford Diesel **Type** three cylinder vertical **Serial No.** *B293648* **Crankshaft** lengthwise **Rated rpm** 2000 **Bore and stroke** (as specified) 4.4" × 4.2" *(111.8 mm × 106.7 mm)* **Compression ratio** 16.3 to 1 **Displacement** 192 cu in *(3142 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements **Oil filter** one full flow cartridge **Oil cooler** radiator for power steering fluid **Fuel filter** one paper element and sediment bowl **Muffler** vertical **Cooling medium temperature control** one thermostat

ENGINE OPERATING PARAMETERS: Fuel rate: 16.5-18.5 lb/hr *(7.5-8.4 kg/hr)* **High idle:** 2150-2200 rpm

CHASSIS: Type front wheel assist **Serial No.** *BC76138* **Tread width** rear 56.0" *(1423 mm)* to 79.8" *(2026 mm)* front 55.0" *(1396 mm)* to 73.0" *(1855 mm)* **Wheel base** 84.1" *(2136 mm)* **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Nominal travel speeds mph (km/h)** first 1.73 *(2.79)* second 2.16 *(3.48)* third 3.79 *(6.10)* fourth 5.16 *(8.30)* fifth 6.18 *(9.94)* sixth 7.71 *(12.41)* seventh 13.52 *(21.76)* eighth 18.49 *(29.75)* reverse 2.49 *(4.00)*, 8.89 *(14.30)* **Clutch** single dry disc operated by foot pedal **Brakes** wet multiple disc operated by two foot pedals which can be locked together **Steering** hydrostatic **Power take-off** 540 rpm at 1800 engine rpm **Unladen tractor mass** 5428 lb *(2462 kg)*

DRAWBAR PERFORMANCE
MAXIMUM POWER IN SELECTED GEARS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp °F (°C) cooling med	Temp °F (°C) Air dry bulb	Barom. inch Hg (kPa)
2nd (2L) Gear									
24.14 (18.00)	4577 (20.36)	1.98 (3.18)	2082	14.85	0.624 (0.379)	11.21 (2.21)	181 (83)	46 (8)	28.97 (98.10)
3rd (3L) Gear									
30.85 (23.00)	3224 (14.34)	3.59 (5.77)	2003	8.39	0.572 (0.348)	12.23 (2.41)	183 (84)	52 (11)	28.78 (97.46)
4th (4L) Gear									
31.32 (23.36)	2333 (10.38)	5.03 (8.10)	2004	5.55	0.563 (0.342)	12.43 (2.45)	183 (84)	54 (12)	28.79 (97.49)
5th (1H) Gear									
31.66 (23.61)	1950 (8.67)	6.09 (9.80)	2001	4.65	0.558 (0.339)	12.54 (2.47)	183 (84)	53 (12)	28.78 (97.46)
6th (2H) Gear									
30.73 (22.91)	1501 (6.67)	7.68 (12.36)	2001	3.58	0.581 (0.353)	12.04 (2.37)	182 (83)	52 (11)	28.78 (97.46)

DRAWBAR PERFORMANCE
FUEL CONSUMPTION CHARACTERISTICS
(Front Drive Disengaged)

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp °F (°C) cooling med	Temp °F (°C) Air dry bulb	Barom. inch Hg (kPa)
Maximum Power—5th (1H) Gear									
31.59 (23.56)	2046 (9.10)	5.79 (9.32)	1996	8.36	0.556 (0.338)	12.57 (2.48)	183 (84)	53 (12)	28.79 (97.49)
75% of Pull at Maximum Power—5th (1H) Gear									
25.27 (18.84)	1535 (6.83)	6.17 (9.93)	2081	6.20	0.590 (0.359)	11.86 (2.34)	181 (83)	46 (8)	29.04 (98.34)
50% of Pull at Maximum Power—5th (1H) Gear									
17.28 (12.88)	1024 (4.55)	6.33 (10.19)	2099	4.03	0.694 (0.422)	10.07 (1.98)	181 (83)	46 (8)	29.04 (98.34)
75% of Pull at Reduced Engine Speed—4th (2H) Gear									
25.23 (18.82)	1534 (6.82)	6.17 (9.93)	1671	6.18	0.541 (0.329)	12.93 (2.55)	179 (82)	46 (8)	29.04 (98.34)
50% of Pull at Reduced Engine Speed—4th (2H) Gear									
17.30 (12.90)	1024 (4.55)	6.34 (10.20)	1685	4.03	0.613 (0.373)	11.41 (2.25)	176 (80)	46 (8)	29.04 (98.34)

DRAWBAR PERFORMANCE
MAXIMUM POWER IN SELECTED GEARS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp °F (°C) cooling med	Temp °F (°C) Air dry bulb	Barom. inch Hg (kPa)
3rd (3L) Gear									
27.51 (20.51)	3030 (13.48)	3.40 (5.48)	2061	14.92	0.604 (0.367)	11.58 (2.28)	181 (83)	47 (8)	28.99 (98.17)
4th (4L) Gear									
30.44 (22.70)	2416 (10.75)	4.73 (7.60)	2002	10.62	0.579 (0.352)	12.08 (2.38)	183 (84)	54 (12)	28.78 (97.46)
5th (1H) Gear									
31.59 (23.56)	2046 (9.10)	5.79 (9.32)	1996	8.36	0.556 (0.338)	12.57 (2.48)	183 (84)	53 (12)	28.79 (97.49)
6th (2H) Gear									
31.29 (23.33)	1582 (7.03)	7.42 (11.94)	2000	6.03	0.567 (0.345)	12.33 (2.43)	182 (83)	52 (11)	28.78 (97.46)

TIRES AND WEIGHT	**Tested Without Ballast**
Rear Tires—No., size, ply & psi (kPa)	Two 13.6-28; 6; 14 (95)
Front Tires—No., size, ply & psi (kPa)	Two 8.3-24; 3; 16 (110)
Height of Drawbar	15.0 in (380 mm)
Static Weight with Operator—Rear	3364 lb (1526 kg)
—Front	2230 lb (1011 kg)
—Total	5594 lb (2537 kg)

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with official OECD, SAE and Nebraska test procedures. For the maximum power tests, the fuel temperature at the injection pump was maintained at 146° F *(63° C)*. The performance figures on this summary were taken from a test conducted under the OECD Code II restricted standard test code procedure.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1643**, Summary 081, July 15, 1991.

LOUIS I. LEVITICUS
Engineer-in-Charge

K. VON BARGEN
R. D. GRISSO
G. J. HOFFMAN
Board of Tractor Test Engineers

THREE POINT HITCH PERFORMANCE (SAE Static Test)

Observed Maximum Pressure psi (bar)	2600 (179)
Location	remote outlet
Hydraulic oil temperature °F(°C)	169 (76)
Location	rear axle sump
Category	I
Quick attach	none

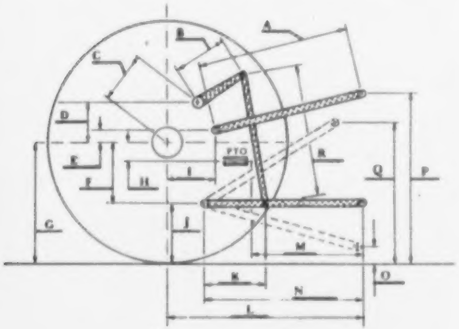
Hitch point distance to ground level in. (mm)	8.3 (211)	13.0 (330)	17.7 (450)	22.4 (569)	27.2 (691)	32.1 (815)
Lift force on frame lb (kN)	3271 (14.5)	3599 (16.0)	3772 (16.8)	3791 (16.9)	3676 (16.3)	3471 (15.4)

THREE POINT HITCH PERFORMANCE (OECD Static Test)

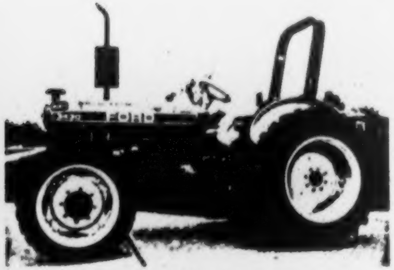
CATEGORY: I
Quick Attach: none

Maximum Force Exerted Through Whole Range	3056 lb (13.6 kN)
i) Opening pressure of relief valve	NA
Sustained pressure of the open relief valve	2630 psi (181 bar)
ii) Pump delivery rate at minimum pressure	7.9 GPM (29.9 l/min)
iii) Pump delivery rate at maximum hydraulic power	7.2 GPM (27.3 l/min)
Delivery pressure	2100 psi (145 bar)
Power	8.8 HP (6.6 kW)

HITCH DIMENSIONS AS TESTED—NO LOAD



	inch	mm
A	28.3	719
B	10.0	254
C	12.9	327
D	10.1	257
E	7.5	191
F	8.0	203
G	24.0	610
H	4.7	120
I	8.7	222
J	16.0	407
K	18.9	481
L	36.7	931
M	20.9	530
N	34.0	864
O	8.0	203
P	34.1	867
Q	33.1	841
R	29.1	740



Ford 3430 8 × 2 Diesel

Agricultural Research Division
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Darrell Nelson, Dean and Director

NEBRASKA OECD TRACTOR TEST 1644—SUMMARY 082
FORD 3930 8 x 2 DIESEL
8 SPEED

POWER TAKE-OFF PERFORMANCE

Power HP (kW)	Crank shaft speed rpm	Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Mean Atmospheric Conditions
MAXIMUM POWER AND FUEL CONSUMPTION					
Rated Engine Speed—(PTO speed—600 rpm)					
45.85 (34.19)	1999	2.83 (10.70)	0.431 (0.262)	16.23 (3.20)	
Standard PTO Speed (PTO—540 RPM)					
43.05 (32.10)	1800	2.65 (10.03)	0.424 (0.258)	16.25 (3.20)	Air temperature
VARYING POWER AND FUEL CONSUMPTION					
45.85 (34.19)	1999	2.83 (10.70)	0.431 (0.262)	16.23 (3.20)	76°F (24°C)
40.58 (30.26)	2085	2.57 (9.74)	0.444 (0.270)	15.79 (3.11)	Relative humidity
30.85 (23.01)	2100	2.10 (7.96)	0.476 (0.290)	14.68 (2.89)	44%
20.65 (15.40)	2127	1.63 (6.17)	0.552 (0.336)	12.67 (2.50)	Barometer
10.42 (7.77)	2147	1.20 (4.55)	0.806 (0.490)	8.68 (1.71)	28.63" Hg (96.95 kPa)
0.12 (0.09)	2169	0.82 (3.09)	45.985 (27.972)	0.15 (0.03)	

Maximum Torque 137 lb.-ft. (186 Nm) at 1401 rpm
Maximum Torque Rise 14.0%

FUEL CONSUMPTION CHARACTERISTICS
DRAWBAR PERFORMANCE
(Front Drive Engaged)

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp. °F (°C) cool-ing med	Temp. °F (°C) Air dry bulb	Barom. inch Hg (kPa)
Maximum Power—5th (1H) Gear									
38.18 (28.47)	2412 (10.73)	5.94 (9.56)	2001	5.74	0.525 (0.319)	13.37 (2.63)	178 (81)	43 (6)	29.05 (98.17)
75% of Pull at Maximum Power—5th (1H) Gear									
30.30 (22.60)	1810 (8.05)	6.28 (10.11)	2084	4.35	0.557 (0.339)	12.56 (2.47)	173 (78)	48 (9)	29.06 (98.41)
50% of Pull at Maximum Power—5th (1H) Gear									
20.76 (15.48)	1208 (5.37)	6.45 (10.37)	2112	3.11	0.652 (0.397)	10.72 (2.11)	173 (78)	48 (9)	29.06 (98.41)
75% of Pull at Reduced Engine Speed—6th (2H) Gear									
30.20 (22.52)	1810 (8.05)	6.26 (10.07)	1662	3.24	0.516 (0.314)	13.51 (2.66)	173 (78)	48 (9)	29.06 (98.41)
50% of Pull at Reduced Engine Speed—6th (2H) Gear									
20.85 (15.55)	1213 (5.39)	6.45 (10.38)	1662	3.17	0.580 (0.353)	12.06 (2.38)	172 (78)	48 (9)	29.06 (98.41)

Location of Test: Tractor Testing Laboratory, University of Nebraska, Lincoln, Nebraska 68583-0832, U.S.A.

Dates of Test: April 8-25, 1991

Manufacturer: FORD NEW HOLLAND, 500 Diller Avenue, New Holland, PA 17557

FUEL OIL and TIME: Fuel No. 2 Diesel **Cetane No.** 53.9 **Specific gravity converted to 60°/60°F, *(15°/15°C)*** 0.8399 **Fuel weight** 6.995 lbs/gal *(0.838 kg/l)* **Oil SAE** 15W-40 **API service classification** SG/CD **To motor** 1.199 gal *(4.538 l)* **Drained from motor** 1.098 gal *(4.158 l)* **Transmission and final drive lubricant** Ford M2C 134-D fluid **Front axle lubricant** Ford M2C 134-D fluid **Total time engine was operated** 25.0 hours.

ENGINE: Make Ford Diesel **Type** three cylinder vertical **Serial No.** *C293877* **Crankshaft** lengthwise **Rated rpm** 2000 **Bore and stroke** (as specified) 4.4" × 4.4" *(111.8 mm × 111.8 mm)* **Compression ratio** 16.3 to 1 **Displacement** 201 cu in *(3294 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements **Oil filter** one full flow cartridge **Oil cooler** radiator for power steering fluid **Fuel filter** one paper element and sediment bowl **Muffler** vertical **Cooling medium temperature control** one thermostat.

ENGINE OPERATING PARAMETERS: Fuel rate 19.0-21.5 lb/hr *(8.6-9.8 kg/hr)* **High idle** 2150-2200 rpm.

CHASSIS: Type front wheel assist **Serial No.** *BC76140* **Tread width** rear 56.0" *(1423 mm)* to 79.8" *(2026 mm)* front 55.0" *(1396 mm)* to 73.0" *(1855 mm)* **Wheel base** 84.1" *(2136 mm)* **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Nominal travel speeds mph *(km/h)*** first 1.73 *(2.79)* second 2.16 *(3.48)* third 3.79 *(6.10)* fourth 5.16 *(8.30)* fifth 6.18 *(9.94)* sixth 7.71 *(12.41)* seventh 13.52 *(21.76)* eighth 18.49 *(29.75)* reverse 2.49 *(4.00)*, 8.89 *(14.30)* **Clutch** single dry disc operated by foot pedal **Brakes** wet multiple disc operated by two foot pedals which can be locked together **Steering** hydrostatic **Power take-off** 540 rpm at 1800 engine rpm **Unladen tractor mass** 5426 lb *(2461 kg)*.

DRAWBAR PERFORMANCE
MAXIMUM POWER IN SELECTED GEARS

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temp °F (°C) cooling med	Air dry bulb	Barom. inch Hg *(kPa)*
				2nd (2L) Gear					
25.21 *(18.80)*	4807 *(21.38)*	1.97 *(3.17)*	2092	14.55	0.605 *(0.368)*	11.55 *(2.28)*	176 *(80)*	55 *(13)*	28.90 *(97.87)*
				3rd (3L) Gear					
36.80 *(27.44)*	3988 *(17.74)*	3.46 *(5.57)*	2000	10.23	0.545 *(0.331)*	12.83 *(2.53)*	181 *(83)*	51 *(11)*	29.05 *(98.37)*
				4th (4L) Gear					
37.47 *(27.94)*	2874 *(12.78)*	4.89 *(7.87)*	2001	7.14	0.537 *(0.327)*	13.03 *(2.57)*	179 *(82)*	48 *(9)*	28.79 *(97.49)*
				5th (1H) Gear					
38.18 *(28.47)*	2412 *(10.73)*	5.94 *(9.56)*	2001	5.74	0.523 *(0.318)*	13.37 *(2.64)*	178 *(81)*	45 *(8)*	29.05 *(98.37)*
				6th (2H) Gear					
37.24 *(27.77)*	1856 *(8.25)*	7.53 *(12.11)*	2001	4.41	0.539 *(0.328)*	12.98 *(2.56)*	179 *(82)*	44 *(7)*	29.06 *(98.41)*

DRAWBAR PERFORMANCE
FUEL CONSUMPTION CHARACTERISTICS
(Front Drive Disengaged)

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temp °F (°C) cooling med	Air dry bulb	Barom. inch Hg *(kPa)*
				Maximum Power—5th (1H) Gear					
38.08 *(28.40)*	2511 *(11.17)*	5.69 *(9.15)*	1998	8.21	0.528 *(0.321)*	13.26 *(2.61)*	179 *(82)*	48 *(9)*	28.95 *(98.04)*
				75% of Pull at Maximum Power—5th (1H) Gear					
30.62 *(22.84)*	1884 *(8.38)*	6.10 *(9.81)*	2084	5.87	0.554 *(0.337)*	12.63 *(2.49)*	172 *(78)*	56 *(13)*	28.91 *(97.90)*
				50% of Pull at Maximum Power—5th (1H) Gear					
21.08 *(15.72)*	1256 *(5.59)*	6.29 *(10.13)*	2110	3.95	0.635 *(0.386)*	11.01 *(2.17)*	172 *(78)*	56 *(13)*	28.94 *(98.00)*
				75% of Pull at Reduced Engine Speed—6th (2H) Gear					
30.60 *(22.82)*	1885 *(8.38)*	6.09 *(9.80)*	1671	5.92	0.513 *(0.312)*	13.64 *(2.69)*	175 *(79)*	56 *(13)*	28.94 *(98.00)*
				50% of Pull at Reduced Engine Speed—6th (2H) Gear					
20.99 *(15.66)*	1254 *(5.58)*	6.28 *(10.10)*	1687	3.87	0.567 *(0.345)*	12.34 *(2.43)*	171 *(77)*	56 *(13)*	28.94 *(98.00)*

DRAWBAR PERFORMANCE
MAXIMUM POWER IN SELECTED GEARS

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temp °F (°C) cooling med	Air dry bulb	Barom. inch Hg *(kPa)*
				3rd (3L) Gear					
32.95 *(24.57)*	3692 *(16.42)*	3.35 *(5.39)*	2065	14.72	0.566 *(0.344)*	12.35 *(2.43)*	175 *(79)*	52 *(11)*	29.05 *(98.37)*
				4th (4L) Gear					
36.82 *(27.46)*	2983 *(13.27)*	4.63 *(7.45)*	2005	10.84	0.545 *(0.332)*	12.85 *(2.53)*	180 *(82)*	51 *(11)*	28.90 *(97.87)*
				5th (1H) Gear					
38.08 *(28.40)*	2511 *(11.17)*	5.69 *(9.15)*	1998	8.21	0.528 *(0.321)*	13.26 *(2.61)*	179 *(82)*	48 *(9)*	28.95 *(98.04)*
				6th (2H) Gear					
37.09 *(27.66)*	1950 *(8.67)*	7.29 *(11.73)*	2001	6.09	0.533 *(0.324)*	13.12 *(2.59)*	180 *(82)*	52 *(11)*	28.95 *(98.04)*

TIRES AND WEIGHT	**Tested Without Ballast**
Rear Tires—No., size, ply & psi *(kPa)*	Two 13.6-28; 6; 14 *(97)*
Front Tires—No., size, ply & psi *(kPa)*	Two 8.3-24; 4; 30 *(210)*
Height of Drawbar	18.5 in *(470 mm)*
Static Weight with Operator—Rear	3354 lb *(1521 kg)*
—Front	2238 lb *(1015 kg)*
—Total	5592 lb *(2536 kg)*

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with official OECD, SAE and Nebraska test procedures. For the maximum power tests, the fuel temperature at the injection pump was maintained at 140° F *(60° C)*. The performance figures on this summary were taken from a test conducted under the OECD Code II restricted standard test code procedure.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1644**, Summary 082, July 15, 1991.

LOUIS I. LEVITICUS
Engineer-in-Charge

K. VON BARGEN
R. D. GRISSO
G. J. HOFFMAN
Board of Tractor Test Engineers

THREE POINT HITCH PERFORMANCE (SAE Static Test)

Observed Maximum Pressure psi *(bar)*	2600 *(179)*
Location	remote outlet
Hydraulic oil temperature °F(°C)	169 *(76)*
Location	rear axle sump
Category	I
Quick attach	none

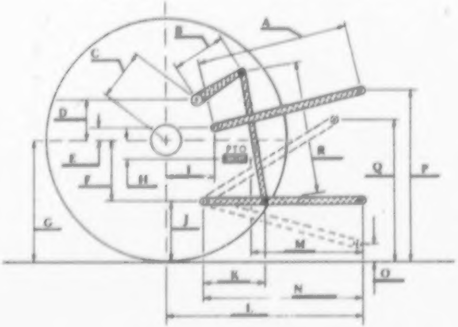
Hitch point distance to ground level in. *(mm)*	8.3 *(211)*	13.0 *(330)*	17.7 *(450)*	22.4 *(569)*	27.2 *(691)*	32.1 *(815)*
Lift force on frame lb	3271	3589	3772	3791	3676	3473
" " " " " " *(kN)*	*(14.5)*	*(16.0)*	*(16.8)*	*(16.9)*	*(16.3)*	*(15.4)*

THREE POINT HITCH PERFORMANCE
(OECD Static Test)

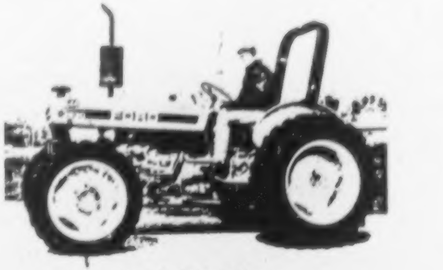
CATEGORY: I
Quick Attach: none

Maximum Force Exerted Through Whole Range:	3056 lbs	*(13.6 kN)*
i) Opening pressure of relief valve:	NA	
Sustained pressure of the open relief valve:	2060 psi	*(142 bar)*
ii) Pump delivery rate at minimum pressure:	7.9 GPM	*(29.9 l/min)*
iii) Pump delivery rate at maximum hydraulic power:	6.8 GPM	*(25.7 l/min)*
Delivery pressure:	2250 psi	*(155 bar)*
Power:	8.9 HP	*(6.7 kW)*

HITCH DIMENSIONS AS TESTED—NO LOAD



	inch	*mm*
A	28.3	*719*
B	10.0	*254*
C	12.9	*327*
D	10.1	*257*
E	7.5	*191*
F	8.0	*203*
G	24.0	*610*
H	4.7	*120*
I	8.7	*222*
J	16.0	*407*
K	18.9	*481*
L	36.7	*931*
M	20.9	*530*
N	34.0	*864*
O	8.0	*203*
P	34.1	*867*
Q	33.1	*841*
R	29.1	*740*



Ford 3930 8 x 2 Diesel

Agricultural Research Division
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Darrell Nelson, Dean and Director

NEBRASKA OECD TRACTOR TEST 1645—SUMMARY 083
FORD 4630 8 x 2 DIESEL
8 SPEED

POWER TAKE-OFF PERFORMANCE

Power HP (kW)	Crank shaft speed rpm	Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Mean Atmospheric Conditions
MAXIMUM POWER AND FUEL CONSUMPTION					
Rated Engine Speed—(PTO speed—660 rpm)					
55.41 *(41.32)*	2200	3.66 *(13.87)*	0.462 *(0.281)*	15.12 *(2.98)*	
Standard PTO Speed (PTO—540 RPM)					
50.77 *(37.86)*	1800	3.23 *(12.22)*	0.445 *(0.270)*	15.73 *(3.10)*	Air temperature
VARYING POWER AND FUEL CONSUMPTION					
55.41 *(41.32)*	2200	3.66 *(13.87)*	0.462 *(0.281)*	15.12 *(2.98)*	75°F *(24°C)*
48.59 *(36.23)*	2274	3.17 *(12.02)*	0.457 *(0.278)*	15.31 *(3.02)*	Relative humidity
37.00 *(27.59)*	2302	2.53 *(9.58)*	0.478 *(0.291)*	14.62 *(2.88)*	37%
24.81 *(18.50)*	2320	1.93 *(7.31)*	0.541 *(0.331)*	12.85 *(2.53)*	Barometer
12.47 *(9.30)*	2341	1.42 *(5.36)*	0.793 *(0.481)*	8.81 *(1.73)*	28.81" Hg *(97.66 kPa)*
0.27 *(0.20)*	2364	0.94 *(3.57)*	24.411 *(14.848)*	0.29 *(0.06)*	

Maximum Torque 156 lb-ft *(212 Nm)* at 1400 rpm
Maximum Torque Rise 18.2%

DRAWBAR PERFORMANCE
FUEL CONSUMPTION CHARACTERISTICS
(Front Drive Engaged)

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp °F (°C) cooling med	Temp °F (°C) Air dry bulb	Barom inch Hg (kPa)
Maximum Power—6th (2H) Gear									
46.47 *(34.66)*	2847 *(12.66)*	6.12 *(9.85)*	2198	6.56	0.554 *(0.337)*	12.63 *(2.49)*	186 *(85)*	64 *(18)*	28.98 *(98.13)*
75% of Pull at Maximum Power—6th (2H) Gear									
37.21 *(27.75)*	2134 *(9.49)*	6.54 *(10.52)*	2303	4.71	0.558 *(0.339)*	12.51 *(2.47)*	184 *(84)*	66 *(19)*	28.95 *(98.03)*
50% of Pull at Maximum Power—6th (2H) Gear									
25.48 *(19.00)*	1423 *(6.33)*	6.71 *(10.80)*	2326	3.16	0.630 *(0.383)*	11.09 *(2.19)*	181 *(83)*	66 *(19)*	28.95 *(98.04)*
75% of Pull at Reduced Engine Speed—7th (3H) Gear									
Available Gear ratios did not permit running this test									
50% of Pull at Reduced Engine Speed—7th (3H) Gear									
25.58 *(19.07)*	1429 *(6.35)*	6.71 *(10.81)*	1325	3.23	0.495 *(0.301)*	14.13 *(2.78)*	181 *(83)*	66 *(19)*	28.95 *(98.03)*

Location of Test: Tractor Testing Laboratory, University of Nebraska, Lincoln Nebraska 68583-0832, U.S.A.

Dates of Test: April 30-May 3, 1991

Manufacturer: FORD NEW HOLLAND, 500 Diller Avenue, New Holland PA 17557

FUEL OIL and TIME: Fuel No. 2 Diesel **Cetane No.** 53.9 **Specific gravity converted to 60°/60°F** *(15°/15°C)* 0.8399 **Fuel weight** 6.993 lbs/gal *(0.838 kg/l)* **Oil SAE** 15W-40 **API service classification** SG/CE **To motor** 1.152 gal *(4.361 l)* **Drained from motor** 1.083 gal *(4.099 l)* **Transmission and final drive lubricant** Ford M2C 134-D fluid **Front axle lubricant** Ford M2C 134-D fluid **Total time engine was operated** 13.0 hours

ENGINE: Make Ford Diesel **Type** three cylinder vertical **Serial No.** *D293790* **Crankshaft** lengthwise **Rated rpm** 2200 **Bore and stroke** (as specified) 4.4" × 4.4" *(111.8 mm × 111.8 mm)* **Compression ratio** 16.5 to 1 **Displacement** 201 cu in *(3293 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements **Oil filter** one full flow cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for power steering fluid **Fuel filter** one paper element and sediment bowl **Muffler** vertical **Cooling medium temperature control** one thermostat

ENGINE OPERATING PARAMETERS: Fuel rate: 24.0-27.5 lb/hr *(10.9-12.5 kg/hr)* **High idle:** 2330-2380 rpm.

CHASSIS: Type front wheel assist **Serial No.** *BC76111* **Tread width** rear 59.6" *(1515 mm)* to 79.8" *(2026 mm)* front 55.0" *(1396 mm)* to 73.0" *(1855 mm)* **Wheel base** 84.1" *(2136 mm)* **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Nominal travel speeds mph *(km/h)*** first 1.45 *(2.33)* second 1.80 *(2.90)* third 3.17 *(5.10)* fourth 4.31 *(6.94)* fifth 5.16 *(8.31)* sixth 6.44 *(10.37)* seventh 11.31 *(18.20)* eighth 15.40 *(24.78)* reverse 2.08 *(3.35)*, 7.43 *(11.95)* **Clutch** single dry disc operated by foot pedal **Brakes** wet multiple disc operated by two foot pedals which can be locked together **Steering** hydrostatic **Power take-off** 540 rpm at 1800 engine rpm **Unladen tractor mass** 5562 lb *(2523 kg)*

DRAWBAR PERFORMANCE
MAXIMUM POWER IN SELECTED GEARS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp °F (°C) cooling med	Temp °F (°C) Air dry bulb	Barom inch Hg (kPa)
3rd (3L) Gear									
36.66 *(27.34)*	4833 *(21.50)*	2.84 *(4.58)*	2279	14.67	0.589 *(0.358)*	11.88 *(2.34)*	182 *(83)*	60 *(16)*	29.00 *(98.21)*
4th (4L) Gear									
44.51 *(33.19)*	4335 *(19.28)*	3.85 *(6.20)*	2198	12.06	0.576 *(0.350)*	12.15 *(2.39)*	186 *(86)*	63 *(17)*	28.99 *(98.17)*
5th (1H) Gear									
46.04 *(34.34)*	3623 *(16.12)*	4.77 *(7.67)*	2199	9.23	0.556 *(0.338)*	12.58 *(2.48)*	186 *(86)*	63 *(17)*	29.00 *(98.21)*
6th (2H) Gear									
46.47 *(34.66)*	2847 *(12.66)*	6.12 *(9.85)*	2198	6.56	0.554 *(0.337)*	12.63 *(2.49)*	186 *(85)*	64 *(18)*	28.98 *(98.14)*

DRAWBAR PERFORMANCE
FUEL CONSUMPTION CHARACTERISTICS
(Front Drive Disengaged)

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp °F (°C) cooling med	Temp °F (°C) Air dry bulb	Barom inch Hg (kPa)
Maximum Power—6th (2H) Gear									
45.02 *(33.58)*	2945 *(13.10)*	5.73 *(9.21)*	2199	11.70	0.567 *(0.345)*	12.34 *(2.43)*	186 *(85)*	65 *(18)*	28.97 *(98.10)*
75% of Pull at Maximum Power—6th (2H) Gear									
36.95 *(27.56)*	2212 *(9.84)*	6.26 *(10.08)*	2294	7.53	0.557 *(0.339)*	12.56 *(2.47)*	184 *(84)*	66 *(19)*	28.94 *(98.00)*
50% of Pull at Maximum Power—6th (2H) Gear									
25.54 *(19.05)*	1473 *(6.55)*	6.50 *(10.47)*	2317	4.96	0.617 *(0.375)*	11.33 *(2.23)*	180 *(82)*	66 *(19)*	28.94 *(98.00)*
75% of Pull at Reduced Engine Speed—7th (3H) Gear									
Available gear ratios did not permit running this test									
50% of Pull at Reduced Engine Speed—7th (3H) Gear									
25.60 *(19.09)*	1473 *(6.55)*	6.52 *(10.49)*	1321	4.90	0.487 *(0.296)*	14.37 *(2.83)*	181 *(83)*	66 *(19)*	28.94 *(98.00)*

DRAWBAR PERFORMANCE
MAXIMUM POWER IN SELECTED GEARS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp °F (°C) cooling med	Temp °F (°C) Air dry bulb	Barom inch Hg (kPa)
5th (1H) Gear									
41.01 *(30.58)*	3331 *(14.81)*	4.62 *(7.43)*	2293	14.94	0.579 *(0.352)*	12.08 *(2.38)*	185 *(85)*	62 *(17)*	29.00 *(98.21)*
6th (2H) Gear									
45.02 *(33.58)*	2945 *(13.10)*	5.73 *(9.21)*	2199	11.70	0.567 *(0.345)*	12.34 *(2.43)*	186 *(85)*	65 *(18)*	28.97 *(98.10)*

TIRES AND WEIGHT	**Tested Without Ballast**
Rear Tires—No., size, ply & psi *(kPa)*	Two 14.9-28; 6; 14 *(95)*
Front Tires—No., size, ply & psi *(kPa)*	Two 8.3-24; 4; 16 *(110)*
Height of Drawbar	16.5 in *(420 mm)*
Static Weight with Operator—Rear	3492 lb *(1584 kg)*
—Front	2236 lb *(1014 kg)*
—Total	5728 lb *(2598 kg)*

REPAIRS AND ADJUSTMENTS: A fuel injector sealing washer was replaced following the PTO tests.

REMARKS: All test results were determined from observed data obtained in accordance with official OECD, SAE and Nebraska test procedures. For the maximum power tests, the fuel temperature at the injection pump was maintained at 147° F *(64° C)*. The performance figures on this summary were taken from a test conducted under the OECD Code II restricted standard test code procedure.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1645**, Summary 083, July 15, 1991.

LOUIS I. LEVITICUS
Engineer-in-Charge

K. VON BARGEN
R. D. GRISSO
G. J. HOFFMAN
Board of Tractor Test Engineers

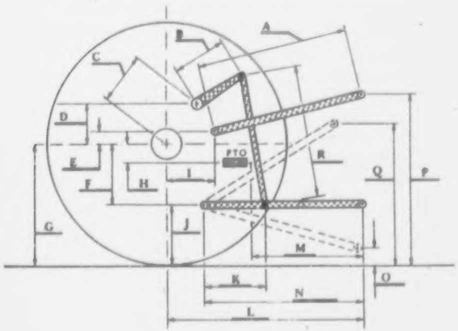
THREE POINT HITCH PERFORMANCE (SAE Static Test)

Observed Maximum Pressure psi (bar)	2460 (170)					
Location	remote outlet					
Hydraulic oil temperature °F(°C)	169 (76)					
Location	rear axle sump					
Category	I					
Quick attach	none					
Hitch point distance to ground level in. (mm)	8.3 (211)	15.0 (380)	17.7 (450)	22.1 (560)	27.2 (691)	32.1 (815)
Lift force on frame lb	3271	3589	3772	3791	3676	3473
(kN)	(14.5)	(16.0)	(16.8)	(16.9)	(16.3)	(15.4)

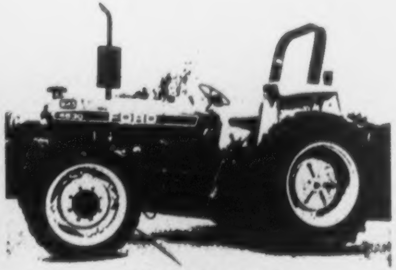
THREE POINT HITCH PERFORMANCE (OECD Static Test)

CATEGORY I		
Quick Attach: none		
Maximum Force Exerted Through Whole Range	3056 lbs	(13.6 kN)
i) Opening pressure of relief valve	N/A	
Sustained pressure of the open relief valve	2640 psi	(182 bar)
ii) Pump delivery rate at minimum pressure	8.8 GPM	(33.3 l/min)
iii) Pump delivery rate at maximum hydraulic power	7.7 GPM	(29.1 l/min)
Delivery pressure	2390 psi	(165 bar)
Power	10.7 HP	(8.0 kW)

HITCH DIMENSIONS AS TESTED—NO LOAD



	inch	mm
A	28.3	719
B	10.0	254
C	12.9	327
D	10.1	257
E	7.5	191
F	8.0	203
G	25.2	640
H	4.7	120
I	8.7	222
J	17.2	437
K	18.9	481
L	36.7	931
M	20.9	530
N	34.0	864
O	9.2	233
P	35.3	897
Q	34.3	871
R	29.1	740



Ford 4630 8 × 2 Diesel

Agricultural Research Division
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Darrell Nelson, Dean and Director

NEBRASKA OECD TRACTOR TEST 1646—SUMMARY 084
FORD 8630 POWERSHIFT DIESEL
18 SPEED

POWER TAKE-OFF PERFORMANCE

Power HP (kW)	Crank shaft speed rpm	Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Mean Atmospheric Conditions
MAXIMUM POWER AND FUEL CONSUMPTION					
Rated Engine Speed—(PTO speed—1147 rpm)					
121.77 (90.80)	2199	7.74 (29.30)	0.444 (0.270)	15.73 (3.10)	
Standard PTO Speed (PTO—1000 RPM)					
117.10 (87.32)	1916	7.00 (26.49)	0.418 (0.254)	16.73 (3.30)	
VARYING POWER AND FUEL CONSUMPTION					Air temperature
121.77 (90.80)	2199	7.74 (29.30)	0.444 (0.270)	15.73 (3.10)	74°F (23°C)
111.68 (83.28)	2375	7.64 (28.91)	0.478 (0.291)	14.62 (2.88)	Relative humidity
84.69 (63.16)	2462	6.48 (24.52)	0.535 (0.325)	13.07 (2.58)	30%
57.10 (42.58)	2425	5.23 (19.81)	0.641 (0.390)	10.91 (2.15)	Barometer
28.56 (21.29)	2437	3.90 (14.78)	0.956 (0.582)	7.31 (1.44)	28.73" Hg (97.29 kPa)
0.49 (0.36)	2455	2.70 (10.21)	38.744 (23.567)	0.18 (0.04)	

Maximum Torque 348 lb.-ft. (471 Nm) at 1501 rpm
Maximum Torque Rise 19.5%

DRAWBAR PERFORMANCE
FUEL CONSUMPTION CHARACTERISTICS
(Front Drive Engaged)

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp °F (°C) cooling med	Temp °F (°C) Air dry bulb	Barom. inch Hg (kPa)
Maximum Power—10th Gear									
104.00 (77.55)	7903 (35.15)	4.93 (7.94)	2198	3.21	0.516 (0.314)	13.55 (2.67)	190 (88)	73 (23)	28.75 (97.36)
75% of Pull at Maximum Power—10th Gear									
85.80 (63.98)	5928 (26.37)	5.43 (8.74)	2195	2.31	0.587 (0.357)	11.91 (2.35)	186 (86)	76 (24)	28.74 (97.32)
50% of Pull at Maximum Power—10th Gear									
58.47 (43.60)	3957 (17.60)	5.54 (8.92)	2127	1.57	0.710 (0.432)	9.85 (1.94)	185 (85)	76 (24)	28.74 (97.32)
75% of Pull at Reduced Engine Speed—11th Gear									
85.71 (63.92)	5927 (26.36)	5.42 (8.73)	2024	2.31	0.516 (0.314)	13.56 (2.67)	186 (85)	76 (24)	28.74 (97.32)
50% of Pull at Reduced Engine Speed—11th Gear									
58.39 (43.54)	3955 (17.59)	5.54 (8.91)	2051	1.57	0.594 (0.362)	11.77 (2.32)	185 (85)	76 (24)	28.74 (97.32)

Location of Test: Tractor Testing Laboratory, University of Nebraska, Lincoln, Nebraska 68583-0832, U.S.A.

Dates of Test: May 14-21, 1991

Manufacturer: FORD NEW HOLLAND, 500 Diller Avenue, New Holland, PA 17557

FUEL OIL and TIME: Fuel No. 2 Diesel **Cetane No.** 53.9 **Specific gravity converted to 60°/60°F** *(15°/15°C)* 0.8399 **Fuel weight** 6.993 lbs/gal *(0.838 kg/l)* **Oil SAE** 15W-40 **API service classification** SG/CF **To motor** 4.018 gal *(15.210 l)* **Drained from motor** 3.755 gal *(14.213 l)* **Transmission and final drive lubricant** Ford M2C 134D fluid **Hydraulic lubricant** Ford M2C 134D fluid **Front axle lubricant** Ford M2C 134D fluid **Total time engine was operated** 19.5 hours

ENGINE: Make Ford Diesel **Type** six cylinder vertical with turbocharger **Serial No.** *U293287* **Crankshaft** lengthwise **Rated rpm** 2200 **Bore and stroke** (as specified) 4.4" × 4.4" *(111.8 mm × 111.8 mm)* **Compression ratio** 15.6 to 1 **Displacement** 401 cu in *(6572 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements and centrifugal precleaner **Oil filter** one full flow cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** one paper element and sediment bowl **Muffler** vertical **Cooling medium temperature control** two thermostats and variable speed fan

ENGINE OPERATING PARAMETERS: Fuel rate 52.2-57.6 lb/hr *(23.7-26.1 kg/hr)* **High idle** 2425-2475 rpm **Turbo boost** nominal 15-19 psi *(103-131 kPa)* as measured 15.4 psi *(106 kPa)*

CHASSIS: Type front wheel assist **Serial No.** *A929001* **Tread width** rear 64.0" *(1625 mm)* to 120.0" *(3048 mm)* front 59.8" *(1520 mm)* to 84.0" *(2134 mm)* **Wheel base** 105.0" *(2667 mm)* **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with full range operator controlled powershift **Nominal travel speeds mph (km/h)** first 1.20 *(1.94)* second 1.43 *(2.30)* third 1.67 *(2.69)* fourth 1.91 *(3.08)* fifth 2.26 *(3.64)* sixth 2.65 *(4.26)* seventh 3.11 *(5.01)* eighth 3.68 *(5.92)* ninth 4.31 *(6.93)* tenth 5.01 *(8.07)* eleventh 5.92 *(9.53)* twelfth 6.93 *(11.16)* thirteenth 7.94 *(12.78)* fourteenth 9.38 *(15.10)* fifteenth 10.98 *(17.67)* sixteenth 12.92 *(20.80)* seventeenth 15.28 *(24.59)* eighteenth 17.88 *(28.77)* reverse 1.93 *(3.11)*, 2.28 *(3.67)*, 2.67 *(4.30)*, 3.06 *(4.92)*, 3.62 *(5.82)*, 4.23 *(6.81)*, 4.98 *(8.02)*, 5.88 *(9.47)*, 6.89 *(11.09)* **Clutch** multiple wet disc electro-hydraulically operated by foot pedal **Brakes** wet disc hydraulically operated by two foot pedals which can be locked together **Steering** hydrostatic **Power take-off** 540 rpm at 1873 engine rpm and 1000 rpm at 1919

DRAWBAR PERFORMANCE
MAXIMUM POWER IN SELECTED GEARS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp °F (°C) cooling med	Temp °F (°C) Air dry bulb	Barom. inch Hg (kPa)
				5th Gear					
78.57 (58.59)	13794 (61.36)	2.13 (3.43)	2403	14.83	0.659 (0.401)	10.61 (2.09)	184 (84)	70 (21)	28.73 (97.29)
				6th Gear					
91.12 (67.95)	12866 (57.23)	2.66 (4.27)	2378	8.68	0.599 (0.364)	11.68 (2.30)	186 (86)	72 (22)	28.74 (97.32)
				7th Gear					
98.77 (73.65)	12149 (54.04)	3.05 (4.91)	2275	6.92	0.552 (0.336)	12.66 (2.49)	187 (86)	72 (22)	28.75 (97.36)
				8th Gear					
100.34 (74.82)	10571 (47.02)	3.56 (5.73)	2200	5.02	0.536 (0.326)	13.05 (2.57)	189 (87)	72 (22)	28.75 (97.36)
				9th Gear					
100.59 (75.01)	8948 (39.80)	4.22 (6.78)	2201	3.85	0.531 (0.323)	13.17 (2.59)	191 (88)	72 (22)	28.75 (97.36)
				10th Gear					
104.00 (77.55)	7903 (35.15)	4.93 (7.94)	2198	3.21	0.516 (0.314)	13.55 (2.67)	190 (88)	73 (23)	28.75 (97.36)
				11th Gear					
102.93 (76.75)	6562 (29.19)	5.88 (9.47)	2201	2.48	0.519 (0.316)	13.47 (2.65)	190 (88)	74 (23)	28.74 (97.32)
				12th Gear					
101.27 (75.52)	5497 (24.45)	6.91 (11.12)	2199	2.15	0.526 (0.320)	13.30 (2.62)	189 (87)	75 (24)	28.74 (97.32)
				13th Gear					
99.51 (74.21)	4704 (20.92)	7.93 (12.77)	2198	1.82	0.539 (0.328)	12.98 (2.56)	190 (88)	75 (24)	28.74 (97.32)
				14th Gear					
97.15 (72.45)	3868 (17.21)	9.42 (15.16)	2202	1.48	0.543 (0.330)	12.89 (2.54)	190 (88)	76 (24)	28.74 (97.32)

DRAWBAR PERFORMANCE
MAXIMUM POWER IN SELECTED GEARS
(Ballasted Tractor)

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp °F (°C) cooling med	Temp °F (°C) Air dry bulb	Barom. inch Hg (kPa)
				4th Gear					
84.23 (62.81)	17414 (77.46)	1.81 (2.91)	2383	14.29	0.636 (0.387)	11.00 (2.17)	186 (86)	67 (19)	28.76 (97.39)
				5th Gear					
96.73 (72.13)	15880 (70.64)	2.28 (3.67)	2353	7.23	0.573 (0.348)	12.21 (2.40)	186 (85)	70 (21)	28.74 (97.32)
				6th Gear					
100.27 (74.77)	14831 (65.97)	2.54 (4.08)	2199	6.18	0.535 (0.326)	13.06 (2.57)	186 (85)	71 (22)	28.74 (97.32)
				7th Gear					
102.38 (76.34)	12705 (56.51)	3.02 (4.86)	2200	5.03	0.525 (0.319)	13.32 (2.62)	190 (88)	73 (23)	28.75 (97.36)
				8th Gear					
101.21 (75.48)	10480 (46.62)	3.62 (5.83)	2201	3.69	0.533 (0.324)	13.13 (2.59)	190 (88)	74 (23)	28.75 (97.36)
				9th Gear					
101.76 (75.88)	8953 (39.82)	4.26 (6.86)	2201	3.04	0.526 (0.320)	13.29 (2.62)	192 (89)	76 (24)	28.75 (97.36)
				10th Gear					
104.43 (77.87)	7865 (34.98)	4.98 (8.01)	2197	2.63	0.516 (0.314)	13.55 (2.67)	191 (88)	77 (25)	28.75 (97.36)
				11th Gear					
103.67 (77.30)	6572 (29.23)	5.92 (9.52)	2198	2.22	0.515 (0.313)	13.57 (2.67)	191 (88)	77 (25)	28.75 (97.36)
				12th Gear					
101.21 (75.47)	5454 (24.26)	6.96 (11.20)	2202	1.98	0.534 (0.325)	13.10 (2.58)	191 (88)	78 (26)	28.75 (97.36)
				13th Gear					
98.96 (73.79)	4646 (20.66)	7.99 (12.86)	2201	1.64	0.537 (0.327)	13.02 (2.57)	191 (88)	79 (26)	28.76 (97.39)
				14th Gear					
96.45 (71.92)	3824 (17.01)	9.46 (15.22)	2201	1.31	0.554 (0.337)	12.62 (2.49)	191 (88)	79 (26)	28.76 (97.39)

engine rpm **Unladen tractor mass** 13990 lb *(6346 kg)*

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with official OECD, SAE and Nebraska test procedures. For the maximum power tests, the fuel temperature at the injection pump return was maintained at 198° F *(92° C)*. This tractor is equipped with a variable speed cooling fan. Since engine power is influenced by fan speed, all power tests were conducted at approximately the same ambient air temperatures. The performance figures on this summary were taken from a test conducted under the OECD Code II restricted standard test code procedure.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1646**, Summary 084, August 20, 1991.

LOUIS I. LEVITICUS
Engineer-in-Charge

K. VON BARGEN
R. D. GRISSO
G. J. HOFFMAN
Board of Tractor Test Engineers

DRAWBAR PERFORMANCE
FUEL CONSUMPTION CHARACTERISTICS
(Front Drive Disengaged)

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp °F (°C) cooling med	Temp °F (°C) Air dry bulb	Barom. inch Hg (kPa)
				Maximum Power—10th Gear					
104.14 (77.66)	7887 (35.08)	4.95 (7.97)	2203	3.08	0.517 (0.315)	13.52 (2.66)	191 (88)	77 (25)	28.75 (97.36)
				75% of Pull at Maximum Power—10th Gear					
85.62 (63.85)	5913 (26.30)	5.43 (8.74)	2395	2.43	0.593 (0.361)	11.79 (2.32)	189 (87)	80 (27)	28.74 (97.32)
				50% of Pull at Maximum Power—10th Gear					
58.28 (43.46)	3944 (17.54)	5.54 (8.92)	2426	1.69	0.720 (0.438)	9.71 (1.91)	185 (85)	80 (27)	28.74 (97.32)
				75% of Pull at Reduced Engine Speed—11th Gear					
85.76 (63.95)	5913 (26.30)	5.44 (8.75)	2029	2.26	0.521 (0.317)	13.43 (2.65)	187 (86)	80 (27)	28.74 (97.32)
				50% of Pull at Reduced Engine Speed—11th Gear					
58.20 (43.40)	3938 (17.51)	5.54 (8.92)	2053	1.52	0.601 (0.366)	11.63 (2.29)	185 (85)	80 (27)	28.74 (97.32)

DRAWBAR PERFORMANCE
MAXIMUM POWER IN SELECTED GEARS

				6th Gear					
90.41 (67.42)	13824 (61.49)	2.45 (3.95)	2320	13.78	0.612 (0.372)	11.43 (2.25)	186 (86)	71 (22)	28.74 (97.32)
				7th Gear					
98.88 (73.73)	12789 (56.89)	2.93 (4.71)	2198	7.62	0.537 (0.327)	13.02 (2.56)	188 (87)	74 (23)	28.74 (97.32)
				8th Gear					
100.54 (74.97)	10562 (46.98)	3.57 (5.74)	2200	4.75	0.536 (0.326)	13.04 (2.57)	191 (88)	75 (24)	28.75 (97.36)
				9th Gear					
101.39 (75.61)	9006 (40.06)	4.22 (6.79)	2201	3.72	0.528 (0.321)	13.25 (2.61)	191 (88)	76 (24)	28.75 (97.36)
				10th Gear					
104.14 (77.66)	7887 (35.08)	4.95 (7.97)	2203	3.08	0.517 (0.315)	13.52 (2.66)	191 (88)	77 (25)	28.75 (97.36)
				11th Gear					
102.87 (76.71)	6553 (29.15)	5.89 (9.47)	2202	2.67	0.523 (0.318)	13.38 (2.64)	190 (88)	77 (25)	28.75 (97.36)
				12th Gear					
100.79 (75.16)	5462 (24.30)	6.92 (11.14)	2203	2.10	0.529 (0.322)	13.21 (2.60)	192 (89)	78 (26)	28.75 (97.36)
				13th Gear					
99.70 (74.34)	4705 (20.93)	7.95 (12.79)	2202	1.85	0.539 (0.328)	12.98 (2.56)	191 (88)	79 (26)	28.76 (97.39)
				14th Gear					
97.50 (72.71)	3884 (17.28)	9.41 (15.15)	2202	1.60	0.551 (0.335)	12.70 (2.50)	192 (89)	79 (26)	28.76 (97.39)

TRACTOR SOUND LEVEL WITH CAB	Front Wheel Drive Disengaged dB(A)	Front Wheel Drive Engaged dB(A)
Maximum Sound Level	79.0	82.0
Bystander	—	—

TIRES AND WEIGHT	**With Ballast**	**Without Ballast**
Rear Tires—No., size, ply & psi *(kPa)*	Four 18.4R38, *, 14 *(95)*	Two 18.4R38, *, 14 *(95)*
Ballast—Duals (total)	1710 lb *(776 kg)*	None
—Cast Iron (total)	None	None
Front Tires—No., size, ply & psi *(kPa)*	Two 14.9-28, 8, 16 *(110)*	Two 14.9-28, 8, 14 *(95)*
Ballast—Liquid (total)	None	None
—Cast Iron (total)	1093 lb *(496 kg)*	None
Height of Drawbar	19.5 in *(495 mm)*	18.0 in *(455 mm)*
Static Weight with Operator—Rear	11151 lb *(5058 kg)*	9444 lb *(4284 kg)*
—Front	5808 lb *(2634 kg)*	4712 lb *(2137 kg)*
—Total	16959 lb *(7692 kg)*	14156 lb *(6421 kg)*

THREE POINT HITCH PERFORMANCE (SAE Static Test)

Observed Maximum Pressure psi *(bar)*	2620 *(181)*
Location	remote lift circuit
Hydraulic oil temperature °F*(°C)*	138 *(59)*
Location	hydraulic sump
Category	II
Quick attach	none

Hitch point distance to ground level in. *(mm)*	8.1 *(206)*	15.0 *(381)*	22.0 *(559)*	29.0 *(737)*	36.0 *(914)*
Lift force on frame lb	8010	8168	8288	8077	8000
" " " " " " *(kN)*	*(35.6)*	*(36.3)*	*(36.9)*	*(35.9)*	*(35.6)*
with lift assist cylinders					
Hitch point distance to ground level in. *(mm)*	8.3 *(211)*	15.0 *(381)*	22.0 *(559)*	29.0 *(737)*	36.0 *(914)*
Lift force on frame lb	13158	12414	11961	11097	10286
" " " " " " *(kN)*	*(58.5)*	*(55.2)*	*(53.2)*	*(49.4)*	*(45.8)*

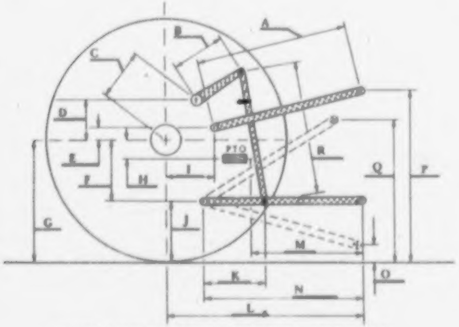
THREE POINT HITCH PERFORMANCE (OECD Static Test)

CATEGORY: II

Quick Attach: none

Maximum Force Exerted Through Whole Range	6305 lbs	*(28.0 kN)*	*8988 lb *(40.0 kN)*
i) Opening pressure of relief valve	NA		
Sustained pressure at compensator cutoff	2570 psi	*(177 bar)*	
ii) Pump delivery rate at minimum pressure and rated engine speed	28.3 GPM	*(107.1 l/min)*	
iii) Pump delivery rate at maximum hydraulic power	24.9 GPM	*(94.3 l/min)*	
Delivery pressure	2150 psi	*(148 bar)*	
Power	31.2 HP	*(23.3 kW)*	*with lift assist cylinders

Ford 8630 Powershift Diesel



HITCH DIMENSIONS AS TESTED—NO LOAD

	inch	*mm*
A	29.8	*756*
B	15.0	*381*
C	16.2	*412*
D	15.5	*394*
E	5.0	*127*
F	10.5	*267*
G	32.3	*820*
H	2.4	*62*
I	17.4	*442*
J	21.8	*553*
K	22.6	*573*
L	45.3	*1150*
M	23.6	*599*
N	36.2	*921*
O	7.7	*196*
P	45.8	*1164*
Q	32.2	*818*
R	34.9	*886*

Agricultural Research Division
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Darrell Nelson, Dean and Director

NEBRASKA OECD TRACTOR TEST 1647—SUMMARY 085
FORD 8730 POWERSHIFT DIESEL
18 SPEED

POWER TAKE-OFF PERFORMANCE

Power HP *(kW)*	Crank shaft speed rpm	Gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Mean Atmospheric Conditions
MAXIMUM POWER AND FUEL CONSUMPTION					
Rated Engine Speed—(PTO speed—1146 rpm)					
140.76 *(104.97)*	2199	9.05 *(34.25)*	0.449 *(0.273)*	15.56 *(3.07)*	
Standard PTO Speed (PTO—1000 RPM)					
133.06 *(99.22)*	1917	8.05 *(30.49)*	0.423 *(0.257)*	16.52 *(3.26)*	Air temperature
VARYING POWER AND FUEL CONSUMPTION					
140.76 *(104.97)*	2199	9.05 *(34.25)*	0.449 *(0.273)*	15.56 *(3.07)*	74°F *(23°C)*
127.31 *(94.94)*	2338	8.71 *(32.97)*	0.478 *(0.291)*	14.62 *(2.88)*	Relative humidity
96.88 *(72.24)*	2374	7.25 *(27.44)*	0.523 *(0.318)*	13.36 *(2.63)*	69%
65.06 *(48.51)*	2399	5.79 *(21.92)*	0.623 *(0.379)*	11.23 *(2.21)*	Barometer
33.12 *(24.69)*	2424	4.12 *(15.59)*	0.870 *(0.529)*	8.04 *(1.58)*	28.61" Hg *(96.87 kPa)*
0.49 *(0.36)*	2452	2.83 *(10.72)*	40.653 *(24.728)*	0.17 *(0.03)*	

Maximum Torque 387 lb.-ft. *(525 Nm)* at 1649 rpm
Maximum Torque Rise 15.2%

DRAWBAR PERFORMANCE
FUEL CONSUMPTION CHARACTERISTICS
(Front Drive Engaged)

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr *(kg/kW.h)*	Fuel Consumption Hp.hr/gal *(kW.h/l)*	Temp °F *(°C)* cooling med	Temp °F *(°C)* Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Power—11th Gear									
123.57 *(92.15)*	7441 *(33.10)*	6.23 *(10.02)*	2199	2.62	0.503 *(0.306)*	13.90 *(2.74)*	186 *(85)*	53 *(12)*	28.99 *(98.17)*
75% of Pull at Maximum Power—11th Gear									
99.02 *(73.84)*	5585 *(24.84)*	6.65 *(10.70)*	2314	2.01	0.567 *(0.345)*	12.32 *(2.43)*	185 *(85)*	63 *(17)*	28.94 *(98.00)*
50% of Pull at Maximum Power—11th Gear									
67.78 *(50.54)*	3721 *(16.55)*	6.83 *(10.99)*	2380	1.30	0.670 *(0.408)*	10.43 *(2.05)*	184 *(84)*	63 *(17)*	28.94 *(98.00)*
75% of Pull at Reduced Engine Speed—12th Gear									
99.75 *(74.38)*	5581 *(24.82)*	6.70 *(10.79)*	2005	1.74	0.500 *(0.304)*	13.98 *(2.75)*	186 *(86)*	63 *(17)*	28.94 *(98.00)*
50% of Pull at Reduced Engine Speed—12th Gear									
67.83 *(50.58)*	3722 *(16.55)*	6.84 *(11.00)*	2034	1.30	0.575 *(0.350)*	12.17 *(2.40)*	184 *(84)*	63 *(17)*	28.94 *(98.00)*

Location of Test: Tractor Testing Laboratory, University of Nebraska, Lincoln, Nebraska 68583-0832, U.S.A.

Dates of Test: May 2-15, 1991

Manufacturer: FORD NEW HOLLAND, 500 Diller Avenue, New Holland, PA 17557

FUEL OIL and TIME: Fuel No. 2 Diesel **Cetane No.** 53.9 **Specific gravity converted to 60°/60°F** *(15°/15°C)* 0.8390 **Fuel weight** 6.985 lbs/gal *(0.838 kg/l)* **Oil SAE** 15W-40 **API service classification** SG/CE **To motor** 4.384 gal *(16.594 l)* **Drained from motor** 4.145 gal *(15.691 l)* **Transmission and final drive lubricant** Ford M2C 134D fluid **Hydraulic lubricant** Ford M2C 134D fluid **Front axle lubricant** Ford M2C 134D fluid **Total time engine was operated** 27.0 hours.

ENGINE: Make Ford Diesel **Type** six cylinder vertical with turbocharger **Serial No.** *112940004* **Crankshaft** lengthwise **Rated rpm** 2200 **Bore and stroke** (as specified) 4.4" × 4.4" *(111.8 mm × 111.8 mm)* **Compression ratio** 15.6 to 1 **Displacement** 401 cu in *(6572 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements and aspirator **Oil filter** one full flow cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** one paper element and sediment bowl **Muffler** vertical **Cooling medium temperature control** two thermostats and variable speed fan.

ENGINE OPERATING PARAMETERS: Fuel rate 61.7-68.3 lb/hr *(28.0-31.0 kg/hr)* **High idle** 2425-2475 rpm **Turbo boost** nominal 16-20 psi *(110-138 kPa)* as measured 19.5 psi *(135 kPa)*

CHASSIS: Type front wheel assist **Serial No.** *A920089* **Tread width** rear 64.0" *(1625 mm)* to 120.0" *(3048 mm)* front 59.8" *(1520 mm)* to 84.0" *(2134 mm)* **Wheel base** 110.8" *(2814 mm)* **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with full range operator controlled powershift **Nominal travel speeds mph (km/h)** first 1.28 *(2.06)* second 1.51 *(2.44)* third 1.77 *(2.85)* fourth 2.03 *(3.27)* fifth 2.40 *(3.86)* sixth 2.81 *(4.52)* seventh 3.30 *(5.32)* eighth 3.90 *(6.28)* ninth 4.57 *(7.35)* tenth 5.32 *(8.56)* eleventh 6.28 *(10.11)* twelfth 7.35 *(11.84)* thirteenth 8.42 *(13.56)* fourteenth 9.96 *(16.02)* fifteenth 11.65 *(18.75)* sixteenth 13.71 *(22.07)* seventeenth 16.21 *(26.09)* eighteenth 18.97 *(30.53)* reverse 2.05 *(3.30)*, 2.42 *(3.90)*, 2.83 *(4.56)*, 3.25 *(5.22)*, 3.84 *(6.17)*, 4.49 *(7.23)*, 5.28 *(8.50)*, 6.25 *(10.05)*, 7.31 *(11.76)* **Clutch** multiple wet disc electro-hydraulically operated by foot pedal **Brakes** wet disc hydraulically operated by two foot pedals which can be locked together **Steering** hydrostatic **Power take-off** 540 rpm at 1875 engine rpm and 1000 rpm at 1919

DRAWBAR PERFORMANCE
MAXIMUM POWER IN SELECTED GEARS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temp °F (°C) cool-ing med	Air dry bulb	Barom. inch Hg (kPa)
				6th Gear					
104.28 (77.76)	15441 (68.68)	2.53 (4.08)	2301	15.00	0.608 (0.370)	11.50 (2.27)	185 (85)	50 (10)	29.00 (98.21)
				7th Gear					
116.54 (86.90)	14179 (63.07)	3.08 (4.96)	2214	8.77	0.540 (0.329)	12.91 (2.54)	186 (85)	52 (11)	29.00 (98.21)
				8th Gear					
119.95 (89.45)	11890 (52.89)	3.78 (6.08)	2202	3.98	0.523 (0.318)	13.38 (2.64)	185 (85)	53 (11)	28.98 (98.13)
				9th Gear					
119.59 (89.18)	10017 (44.56)	4.48 (7.21)	2201	3.73	0.520 (0.316)	13.45 (2.65)	187 (86)	54 (12)	28.98 (98.13)
				10th Gear					
122.65 (91.46)	8761 (38.98)	5.25 (8.45)	2200	2.90	0.508 (0.309)	13.76 (2.71)	187 (86)	55 (13)	28.98 (98.13)
				11th Gear					
123.57 (92.15)	7411 (32.96)	6.23 (10.03)	2199	2.62	0.503 (0.306)	13.90 (2.74)	186 (85)	53 (12)	28.99 (98.17)
				12th Gear					
120.70 (90.00)	6170 (27.45)	7.34 (11.81)	2205	2.18	0.517 (0.314)	13.53 (2.67)	186 (86)	52 (11)	29.00 (98.21)
				13th Gear					
119.21 (88.89)	5310 (23.62)	8.42 (13.55)	2201	1.74	0.522 (0.318)	13.39 (2.64)	187 (86)	54 (12)	28.98 (98.13)

DRAWBAR PERFORMANCE
MAXIMUM POWER IN SELECTED GEARS
(Ballasted Tractor)

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temp °F (°C) cool-ing med	Air dry bulb	Barom. inch Hg (kPa)
				4th Gear					
93.09 (69.42)	18180 (80.87)	1.92 (3.09)	2345	11.25	0.621 (0.378)	11.20 (2.21)	186 (85)	71 (22)	28.91 (97.91)
				5th Gear					
114.05 (85.05)	18435 (81.99)	2.32 (3.73)	2272	7.91	0.556 (0.338)	12.57 (2.48)	186 (86)	70 (21)	29.00 (98.21)
				6th Gear					
118.89 (88.66)	16518 (73.48)	2.70 (4.35)	2201	5.51	0.526 (0.320)	13.29 (2.62)	186 (86)	69 (21)	29.00 (98.21)
				7th Gear					
121.71 (90.76)	14223 (63.27)	3.21 (5.17)	2199	4.51	0.511 (0.311)	13.61 (2.68)	187 (86)	71 (22)	28.91 (97.91)
				8th Gear					
120.86 (90.13)	11821 (52.58)	3.83 (6.17)	2198	3.45	0.513 (0.312)	13.64 (2.69)	192 (89)	72 (22)	28.98 (98.13)
				9th Gear					
120.01 (89.49)	9919 (44.12)	4.54 (7.30)	2202	2.68	0.521 (0.317)	13.42 (2.64)	190 (88)	65 (18)	28.95 (98.04)
				10th Gear					
121.54 (90.63)	8597 (38.24)	5.30 (8.53)	2202	2.07	0.516 (0.314)	13.55 (2.67)	191 (88)	68 (20)	28.96 (98.06)
				11th Gear					
121.98 (90.96)	7292 (32.44)	6.27 (10.10)	2196	1.81	0.518 (0.315)	13.63 (2.68)	188 (87)	69 (21)	28.95 (98.04)
				12th Gear					
119.85 (89.37)	6091 (27.09)	7.38 (11.88)	2200	1.54	0.524 (0.319)	13.36 (2.63)	190 (88)	69 (21)	28.95 (98.04)
				13th Gear					
118.61 (88.45)	5257 (23.38)	8.46 (13.62)	2197	1.37	0.527 (0.321)	13.26 (2.61)	191 (88)	70 (21)	28.95 (98.04)

engine rpm **Unladen tractor mass** 15248 lb *(6916 kg)*

REPAIRS AND ADJUSTMENTS: No repairs or adjustments

REMARKS: All test results were determined from observed data obtained in accordance with official OECD, SAE and Nebraska test procedures. For the maximum power tests, the fuel temperature at the injection pump return was maintained at 176° F *(80° C)*. This tractor is equipped with a variable speed cooling fan. Since engine power is influenced by fan speed, all power tests were conducted at approximately the same ambient air temperatures. The performance figures on this summary were taken from a test conducted under the OECD Code II restricted standard test code procedure.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1647**, Summary 085, August 20, 1991.

LOUIS I. LEVITICUS
Engineer-in-Charge

K. VON BARGEN
R. D. GRISSO
G. J. HOFFMAN
Board of Tractor Test Engineers

DRAWBAR PERFORMANCE
FUEL CONSUMPTION CHARACTERISTICS
(Front Drive Disengaged)

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temp °F (°C) cool-ing med	Air dry bulb	Barom. inch Hg (kPa)
				Maximum Power—11th Gear					
121.80 (90.83)	7310 (32.51)	6.25 (10.06)	2202	2.30	0.515 (0.313)	13.59 (2.68)	188 (86)	69 (21)	28.95 (98.04)
				75% of Pull at Maximum Power—11th Gear					
97.80 (72.93)	5485 (24.40)	6.69 (10.76)	2343	1.78	0.578 (0.352)	12.11 (2.39)	188 (87)	75 (24)	28.91 (97.90)
				50% of Pull at Maximum Power—11th Gear					
66.74 (49.77)	3660 (16.28)	6.84 (11.01)	2383	1.25	0.695 (0.423)	10.10 (1.99)	185 (85)	75 (24)	28.91 (97.90)
				75% of Pull at Reduced Engine Speed—12th Gear					
97.72 (72.87)	5392 (23.98)	6.80 (10.94)	2002	1.60	0.509 (0.310)	13.75 (2.71)	188 (86)	75 (24)	28.91 (97.90)
				50% of Pull at Reduced Engine Speed—12th Gear					
66.89 (49.88)	3652 (16.24)	6.87 (11.06)	2015	1.16	0.586 (0.356)	11.94 (2.35)	181 (83)	75 (24)	28.91 (97.90)

DRAWBAR PERFORMANCE
MAXIMUM POWER IN SELECTED GEARS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temp °F (°C) cool-ing med	Air dry bulb	Barom. inch Hg (kPa)
				6th Gear					
105.13 (78.39)	15427 (68.62)	2.56 (4.11)	2201	11.07	0.599 (0.365)	11.67 (2.30)	186 (86)	70 (21)	29.00 (98.21)
				7th Gear					
117.48 (87.60)	13217 (58.79)	3.33 (5.36)	2199	7.61	0.529 (0.322)	13.21 (2.60)	188 (86)	71 (22)	28.98 (98.13)
				8th Gear					
119.95 (89.45)	11897 (52.92)	3.78 (6.09)	2201	4.76	0.519 (0.316)	13.37 (2.63)	191 (88)	72 (22)	28.98 (98.13)
				9th Gear					
120.02 (89.50)	10015 (44.55)	4.49 (7.23)	2201	3.16	0.520 (0.316)	13.45 (2.65)	189 (87)	63 (17)	28.96 (98.07)
				10th Gear					
121.61 (90.71)	8688 (38.65)	5.25 (8.45)	2198	2.74	0.517 (0.315)	13.52 (2.66)	190 (88)	68 (20)	28.96 (98.07)
				11th Gear					
121.80 (90.83)	7310 (32.51)	6.25 (10.06)	2202	2.30	0.515 (0.313)	13.59 (2.68)	188 (86)	69 (21)	28.95 (98.04)
				12th Gear					
119.71 (89.27)	6111 (27.18)	7.34 (11.82)	2201	1.87	0.525 (0.319)	13.33 (2.63)	191 (88)	69 (21)	28.95 (98.04)
				13th Gear					
118.59 (88.43)	5282 (23.50)	8.42 (13.55)	2197	1.52	0.532 (0.324)	13.11 (2.58)	192 (89)	71 (22)	28.95 (98.04)

	Front Wheel Drive Disengaged dB(A)	 Engaged dB(A)
TRACTOR SOUND LEVEL WITH CAB		
Maximum Sound Level	82.0	82.0
Bystander	—	—

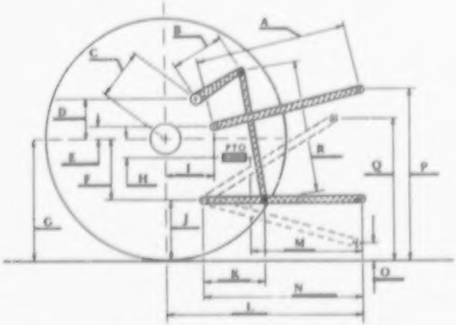
TIRES AND WEIGHT	**With Ballast**	**Without Ballast**
Rear Tires—No., size, ply & psi (kPa)	Four 18.4R42; **; 14 (97)	Two 18.4R42; **; 14 (97)
Ballast—Fluids (total)	1000 lb (453 kg)	None
—Cast Iron (total)	124 lb (56 kg)	None
Front Tires—No., size, ply & psi (kPa)	Two 16.9R28; 8; 16 (110)	Two 16.9R28; 8; 16 (110)
Ballast—Liquid (total)	None	None
—Cast Iron (total)	516 lb (234 kg)	None
Height of Drawbar	21 in (535 mm)	20 in (510 mm)
Static Weight with Operator—Rear	11624 lb (5273 kg)	9620 lb (4364 kg)
—Front	6308 lb (2861 kg)	5792 lb (2627 kg)
—Total	17932 lb (8134 kg)	15412 lb (6991 kg)

THREE POINT HITCH PERFORMANCE (SAE Static Test)

Observed Maximum Pressure psi *(bar)*	2620 *(181)*				
Location	remote lift circuit				
Hydraulic oil temperature °F(°C)	145 *(63)*				
Location	hydraulic sump				
Category	III				
Quick attach	none				
Hitch point distance to ground level in. *(mm)*	8.0 *(203)*	16.0 *(406)*	24.0 *(610)*	32.0 *(813)*	40.0 *(1016)*
Lift force on frame lb *(kN)*	8585 *(38.2)*	8481 *(37.7)*	8668 *(38.6)*	8279 *(36.8)*	7788 *(34.6)*
with lift assist cylinders					
Hitch point distance to ground level in. *(mm)*	8.2 *(208)*	16.0 *(406)*	24.0 *(610)*	32.0 *(813)*	40.0 *(1016)*
Lift force on frame lb *(kN)*	12987 *(57.8)*	12424 *(55.3)*	11991 *(53.3)*	11458 *(51.0)*	10548 *(46.9)*

THREE POINT HITCH PERFORMANCE (OECD Static Test)

CATEGORY III			
Quick Attach: none			
Maximum Force Exerted Through Whole Range	6791 lbs	*(30.2 kN)*	*9306 lb *(41.4 kN)*
i) Opening pressure of relief valve	NA		
Sustained pressure with pump stalled	2640 psi	*(182 bar)*	
ii) Pump delivery rate at minimum pressure and rated engine speed	28.5 GPM	*(107.9 l/min)*	
iii) Pump delivery rate at maximum hydraulic power	25.5 GPM	*(96.5 l/min)*	
Delivery pressure	2250 psi	*(155 bar)*	
Power	33.5 HP	*(25.0 kW)*	*with lift assist cylinders



HITCH DIMENSIONS AS TESTED—NO LOAD

	inch	mm
A	29.0	737
B	15.0	381
C	16.2	412
D	15.5	394
E	8.0	203
F	10.5	267
G	34.2	870
H	2.4	62
I	17.4	442
J	23.7	603
K	22.2	564
L	44.7	1135
M	23.0	584
N	35.7	906
O	9.6	244
P	50.7	1288
Q	34.1	866
R	34.9	886

Ford 8730 Powershift Diesel

Agricultural Research Division
Institute of Agriculture and Natural Resources
University of Nebraska-Lincoln
Darrell Nelson, Dean and Director

NEBRASKA OECD TRACTOR TEST 1648—SUMMARY 086
FORD 8830 POWERSHIFT DIESEL
18 SPEED

POWER TAKE-OFF PERFORMANCE

Power HP *(kW)*	Crank shaft speed rpm	Gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Mean Atmospheric Conditions
MAXIMUM POWER AND FUEL CONSUMPTION					
Rated Engine Speed—(PTO speed—1147 rpm)					
171.04 *(127.54)*	2198	10.56 *(39.99)*	0.432 *(0.263)*	16.19 *(3.19)*	
Standard PTO Speed (PTO—1000 RPM)					
166.48 *(124.14)*	1918	9.76 *(36.95)*	0.410 *(0.249)*	17.06 *(3.36)*	
VARYING POWER AND FUEL CONSUMPTION					Air temperature
171.04 *(127.54)*	2198	10.56 *(39.99)*	0.432 *(0.263)*	16.19 *(3.19)*	72°F *(22°C)*
158.89 *(118.48)*	2399	10.42 *(39.46)*	0.459 *(0.279)*	15.24 *(3.00)*	Relative humidity
118.53 *(88.39)*	2425	8.54 *(32.32)*	0.504 *(0.306)*	13.88 *(2.73)*	60%
79.42 *(59.22)*	2455	6.95 *(26.31)*	0.612 *(0.372)*	11.43 *(2.25)*	Barometer
40.36 *(30.10)*	2443	5.53 *(20.95)*	0.959 *(0.583)*	7.29 *(1.44)*	29.09" Hg *(98.50 kPa)*
0.49 *(0.37)*	2469	3.56 *(13.48)*	50.767 *(30.880)*	0.14 *(0.03)*	

Maximum Torque 485 lb.-ft *(657 Nm)* at 1600 rpm
Maximum Torque Rise 18.2%

DRAWBAR PERFORMANCE
FUEL CONSUMPTION CHARACTERISTICS
(Front Drive Engaged)

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr *(kg/kW.h)*	Fuel Consumption Hp.hr/gal *(kW.h/l)*	Temp. °F *(°C)* cooling med	Temp. °F *(°C)* Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Power—11th Gear									
144.56 *(107.80)*	8880 *(39.50)*	6.10 *(9.82)*	2200	2.91	0.511 *(0.311)*	13.70 *(2.70)*	190 *(88)*	66 *(19)*	29.08 *(98.48)*
75% of Pull at Maximum Power—11th Gear									
119.73 *(89.29)*	6664 *(29.64)*	6.74 *(10.84)*	2406	2.23	0.559 *(0.340)*	12.52 *(2.47)*	189 *(87)*	71 *(22)*	29.04 *(98.34)*
50% of Pull at Maximum Power—11th Gear									
81.55 *(60.81)*	4445 *(19.77)*	6.88 *(11.07)*	2459	1.54	0.659 *(0.401)*	10.61 *(2.09)*	185 *(85)*	71 *(22)*	29.04 *(98.34)*
75% of Pull at Reduced Engine Speed—12th Gear									
119.54 *(89.14)*	6658 *(29.62)*	6.73 *(10.83)*	2055	2.23	0.506 *(0.308)*	13.83 *(2.72)*	187 *(86)*	71 *(22)*	29.04 *(98.34)*
50% of Pull at Reduced Engine Speed—12th Gear									
81.60 *(60.85)*	4445 *(19.77)*	6.89 *(11.08)*	2080	1.45	0.570 *(0.347)*	12.26 *(2.41)*	184 *(84)*	71 *(22)*	29.04 *(98.34)*

Location of Test: Tractor Testing Laboratory, University of Nebraska, Lincoln, Nebraska 68583-0832, U.S.A.

Dates of Test: May 17-22, 1991

Manufacturer: FORD NEW HOLLAND, 500 Diller Avenue, New Holland, PA 17557

FUEL OIL and TIME: Fuel No. 2 Diesel **Cetane No.** 53.9 **Specific gravity converted to 60°/60°F** *(15°/15°C)* 0.8399 **Fuel weight** 6.993 lbs/gal *(0.838 kg/l)* **Oil SAE** 15W-40 **API service classification** SG/CE **To motor** 4.253 gal *(16.099 l)* **Drained from motor** 4.028 gal *(15.246 l)* **Transmission and final drive lubricant** Ford M2C 134D fluid **Hydraulic lubricant** Ford M2C 134D fluid **Front axle lubricant** Ford M2C 134D fluid **Total time engine was operated** 20.5 hours.

ENGINE: Make Ford Diesel **Type** six cylinder vertical with turbocharger and air to air intercooler **Serial No.** *M294149* **Crankshaft** lengthwise **Rated rpm** 2200 **Bore and stroke** (as specified) 4.4" × 4.4" *(111.8 mm × 111.8 mm)* **Compression ratio** 15.6 to 1 **Displacement** 401 cu in *(6572 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements and aspirator **Oil filter** two full flow cartridges **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** one paper element and sediment bowl **Muffler** vertical **Cooling medium temperature control** two thermostats and variable speed fan.

ENGINE OPERATING PARAMETERS: Fuel rate 71.6-79.2 lb/hr *(32.5-35.9 kg/hr)* **High idle** 2425-2475 rpm **Turbo boost** nominal 15-19 psi *(103-131 kPa)* as measured 18.0 psi *(124 kPa)*

CHASSIS: Type front wheel assist **Serial No.** *A928907* **Tread width** rear 64.0" *(1626 mm)* to 120.0" *(3048 mm)* front 59.8" *(1520 mm)* to 84.0" *(2134 mm)* **Wheel base** 110.8" *(2814 mm)* **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with full range operator controlled powershift **Nominal travel speeds mph (km/h)** first 1.26 *(2.03)* second 1.49 *(2.39)* third 1.74 *(2.80)* fourth 1.99 *(3.21)* fifth 2.36 *(3.79)* sixth 2.76 *(4.44)* seventh 3.25 *(5.22)* eighth 3.84 *(6.17)* ninth 4.49 *(7.22)* tenth 5.23 *(8.41)* eleventh 6.18 *(9.94)* twelfth 7.23 *(11.63)* thirteenth 8.28 *(13.32)* fourteenth 9.79 *(15.75)* fifteenth 11.45 *(18.43)* sixteenth 13.48 *(21.69)* seventeenth 15.93 *(25.64)* eighteenth 18.64 *(30.00)* reverse 2.01 *(3.24)*, 2.38 *(3.83)*, 2.79 *(4.48)*, 3.19 *(5.13)*, 3.77 *(6.07)*, 4.41 *(7.10)*, 5.19 *(8.36)*, 6.14 *(9.88)*, 7.18 *(11.56)* **Clutch** multiple wet disc electro-hydraulically operated by foot pedal **Brakes** wet disc hydraulically operated by two foot pedals which can be locked together **Steering** hydrostatic **Power take-off** 1000 rpm at 1919 engine rpm **Unladen tractor mass** 15560 lb *(7058 kg)*.

DRAWBAR PERFORMANCE
MAXIMUM POWER IN SELECTED GEARS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp °F (°C) cooling med	Temp °F (°C) Air dry bulb	Barom. inch Hg (kPa)
				7th Gear					
127.31 *(94.94)*	15431 *(68.64)*	3.09 *(4.98)*	2391	13.95	0.603 *(0.367)*	11.60 *(2.28)*	186 *(85)*	64 *(18)*	29.08 *(98.18)*
				8th Gear					
138.80 *(103.50)*	13700 *(60.94)*	3.80 *(6.11)*	2291	6.73	0.545 *(0.331)*	12.83 *(2.53)*	188 *(87)*	65 *(18)*	29.08 *(98.18)*
				9th Gear					
140.14 *(104.50)*	12046 *(53.58)*	4.36 *(7.02)*	2202	4.82	0.526 *(0.320)*	13.29 *(2.62)*	187 *(86)*	67 *(19)*	29.07 *(98.14)*
				10th Gear					
143.33 *(106.88)*	10483 *(46.63)*	5.13 *(8.25)*	2201	3.92	0.514 *(0.313)*	13.61 *(2.68)*	188 *(87)*	67 *(19)*	29.07 *(98.14)*
				11th Gear					
144.56 *(107.80)*	8886 *(39.53)*	6.10 *(9.82)*	2200	2.91	0.511 *(0.311)*	13.70 *(2.70)*	190 *(88)*	66 *(19)*	29.08 *(98.18)*
				12th Gear					
142.16 *(106.01)*	7408 *(32.95)*	7.20 *(11.58)*	2202	2.57	0.519 *(0.315)*	13.49 *(2.66)*	189 *(87)*	66 *(19)*	29.08 *(98.18)*
				13th Gear					
140.27 *(104.60)*	6352 *(28.26)*	8.28 *(13.33)*	2203	2.14	0.524 *(0.319)*	13.35 *(2.63)*	189 *(87)*	66 *(19)*	29.08 *(98.18)*

DRAWBAR PERFORMANCE
MAXIMUM POWER IN SELECTED GEARS
(Ballasted Tractor)

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp °F (°C) cooling med	Temp °F (°C) Air dry bulb	Barom. inch Hg (kPa)
				5th Gear					
127.29 *(94.92)*	21043 *(93.60)*	2.27 *(3.65)*	2368	12.40	0.602 *(0.366)*	11.61 *(2.29)*	186 *(86)*	72 *(22)*	28.86 *(97.73)*
				6th Gear					
136.71 *(101.94)*	18472 *(82.17)*	2.78 *(4.47)*	2317	6.36	0.555 *(0.338)*	12.59 *(2.48)*	188 *(87)*	73 *(23)*	28.87 *(97.77)*
				7th Gear					
139.88 *(104.31)*	16654 *(74.08)*	3.15 *(5.07)*	2208	5.33	0.527 *(0.320)*	13.28 *(2.62)*	191 *(88)*	75 *(24)*	28.88 *(97.80)*
				8th Gear					
140.15 *(104.51)*	13980 *(62.19)*	3.76 *(6.05)*	2198	3.94	0.524 *(0.319)*	13.34 *(2.63)*	191 *(88)*	75 *(24)*	28.88 *(97.80)*
				9th Gear					
140.17 *(104.52)*	11831 *(52.63)*	4.44 *(7.15)*	2204	3.27	0.524 *(0.319)*	13.35 *(2.63)*	192 *(89)*	75 *(24)*	28.88 *(97.80)*
				10th Gear					
144.01 *(107.39)*	10388 *(46.21)*	5.20 *(8.37)*	2203	2.68	0.513 *(0.312)*	13.64 *(2.69)*	196 *(91)*	76 *(24)*	28.87 *(97.77)*
				11th Gear					
142.37 *(106.16)*	8641 *(38.44)*	6.18 *(9.94)*	2204	2.34	0.520 *(0.316)*	13.43 *(2.65)*	192 *(89)*	79 *(26)*	28.90 *(97.87)*
				12th Gear					
139.22 *(103.82)*	7187 *(31.97)*	7.26 *(11.69)*	2203	1.56	0.529 *(0.322)*	13.22 *(2.60)*	192 *(89)*	81 *(27)*	28.90 *(97.87)*
				13th Gear					
136.97 *(102.14)*	6165 *(27.41)*	8.33 *(13.41)*	2202	1.39	0.540 *(0.329)*	12.96 *(2.55)*	193 *(89)*	83 *(28)*	28.89 *(97.83)*

REPAIRS AND ADJUSTMENTS: No repairs or adjustments

REMARKS: All test results were determined from observed data obtained in accordance with official OECD, SAE and Nebraska test procedures. For the maximum power tests, the fuel temperature at the injection pump return was maintained at 179° F *(82° C)*. This tractor is equipped with a variable speed cooling fan. Since engine power is influenced by fan speed, all power tests were conducted at approximately the same ambient air temperatures. The performance figures on this summary were taken from a test conducted under the OECD Code II restricted standard test code procedure.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1648**, Summary 086, August 20, 1991

LOUIS I. LEVITICUS
Engineer-in-Charge

K. VON BARGEN
R. D. GRISSO
G. J. HOFFMAN
Board of Tractor Test Engineers

DRAWBAR PERFORMANCE
FUEL CONSUMPTION CHARACTERISTICS
(Front Drive Disengaged)

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp °F (°C) cooling med	Temp °F (°C) Air dry bulb	Barom. inch Hg (kPa)
				Maximum Power—10th Gear					
143.41 *(106.94)*	10482 *(46.62)*	5.13 *(8.26)*	2202	3.55	0.514 *(0.313)*	13.61 *(2.68)*	196 *(91)*	78 *(26)*	28.89 *(97.83)*
				75% of Pull at Maximum Power—10th Gear					
119.25 *(88.93)*	7868 *(35.00)*	5.68 *(9.15)*	2410	2.54	0.566 *(0.344)*	12.35 *(2.43)*	190 *(88)*	82 *(28)*	28.89 *(97.83)*
				50% of Pull at Maximum Power—10th Gear					
81.14 *(60.51)*	5243 *(23.32)*	5.80 *(9.34)*	2440	1.60	0.657 *(0.400)*	10.64 *(2.10)*	185 *(85)*	82 *(28)*	28.89 *(97.83)*
				75% of Pull at Reduced Engine Speed—11th Gear					
119.10 *(88.81)*	7868 *(35.00)*	5.68 *(9.14)*	2038	2.45	0.508 *(0.309)*	13.76 *(2.71)*	187 *(86)*	82 *(28)*	28.89 *(97.83)*
				50% of Pull at Reduced Engine Speed—11th Gear					
81.10 *(60.47)*	5245 *(23.33)*	5.80 *(9.33)*	2063	1.60	0.566 *(0.344)*	12.35 *(2.43)*	185 *(85)*	82 *(28)*	28.89 *(97.83)*

DRAWBAR PERFORMANCE
MAXIMUM POWER IN SELECTED GEARS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp °F (°C) cooling med	Temp °F (°C) Air dry bulb	Barom. inch Hg (kPa)
				7th Gear					
128.14 *(95.56)*	16306 *(72.53)*	2.95 *(4.74)*	2256	13.01	0.580 *(0.353)*	12.05 *(2.37)*	190 *(88)*	74 *(23)*	28.87 *(97.77)*
				8th Gear					
137.85 *(102.79)*	13989 *(62.23)*	3.70 *(5.95)*	2201	5.34	0.532 *(0.324)*	13.14 *(2.59)*	191 *(88)*	75 *(24)*	28.88 *(97.80)*
				9th Gear					
139.52 *(104.04)*	11937 *(53.10)*	4.38 *(7.05)*	2202	4.13	0.526 *(0.320)*	13.30 *(2.62)*	195 *(91)*	74 *(23)*	28.86 *(97.73)*
				10th Gear					
143.41 *(106.94)*	10482 *(46.62)*	5.13 *(8.26)*	2202	3.55	0.513 *(0.313)*	13.61 *(2.68)*	196 *(91)*	78 *(26)*	28.89 *(97.83)*
				11th Gear					
141.51 *(105.52)*	8677 *(38.59)*	6.12 *(9.84)*	2204	2.71	0.520 *(0.316)*	13.44 *(2.65)*	193 *(89)*	80 *(27)*	28.90 *(97.87)*
				12th Gear					
139.02 *(103.67)*	7261 *(32.30)*	7.18 *(11.55)*	2198	2.11	0.529 *(0.322)*	13.22 *(2.60)*	193 *(89)*	82 *(28)*	28.89 *(97.83)*
				13th Gear					
137.72 *(102.70)*	6251 *(27.80)*	8.26 *(13.30)*	2200	1.77	0.532 *(0.324)*	13.14 *(2.59)*	193 *(89)*	84 *(29)*	28.89 *(97.83)*

TRACTOR SOUND LEVEL WITH CAB	Front Wheel Drive Disengaged dB(A)	Front Wheel Drive Engaged dB(A)
Maximum Sound Level	79.0	80.0
Bystander		

TIRES AND WEIGHT	With Ballast	Without Ballast
Rear Tires—No., size, ply & psi *(kPa)*	Four 20.8R38, **, 14 *(97)*	Two 20.8R38, **, 14 *(97)*
Ballast—Duals (total)	1900 lb *(862 kg)*	None
—Cast Iron (total)	1225 lb *(556 kg)*	None
Front Tires—No., size, ply & psi *(kPa)*	Two 16.9-28, 8, 16 *(110)*	Two 16.9-28, 8, 16 *(110)*
Ballast—Liquid (total)	None	None
—Cast Iron (total)	1450 lb *(658 kg)*	None
Height of Drawbar	20.5 in *(520 mm)*	19.0 in *(483 mm)*
Static Weight with Operator—*Rear*	13020 lb *(5906 kg)*	9895 lb *(4488 kg)*
—*Front*	7280 lb *(3302 kg)*	5830 lb *(2645 kg)*
—Total	20300 lb *(9208 kg)*	15725 lb *(7133 kg)*

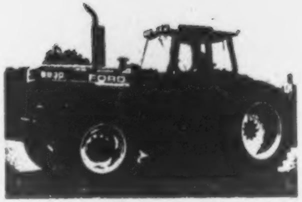
THREE POINT HITCH PERFORMANCE (SAE Static Test)

Observed Maximum Pressure psi (bar)	2620 (181)
Location	remote lift circuit
Hydraulic oil temperature °F(°C)	145 (63)
Location	hydraulic sump
Category	III
Quick attach	none

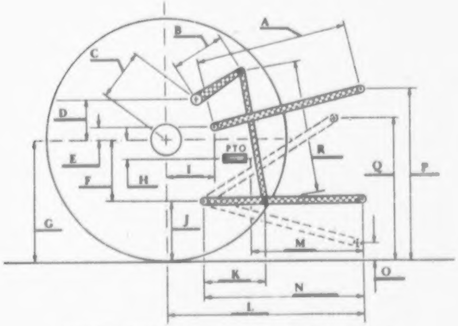
Hitch point distance to ground level in. (mm)	8.0 (203)	16.0 (406)	24.0 (610)	32.0 (813)	40.0 (1016)
Lift force on frame lb (kN)	8385 (37.3)	8181 (36.4)	8048 (35.8)	8279 (36.8)	7798 (34.7)
with lift assist cylinders					
Hitch point distance to ground level in. (mm)	8.2 (208)	16.0 (406)	24.0 (610)	32.0 (813)	40.0 (1016)
Lift force on frame lb (kN)	12987 (57.8)	12424 (55.3)	11999 (53.4)	11458 (51.0)	10318 (45.9)

THREE POINT HITCH PERFORMANCE
(OECD Static Test)

CATEGORY: III			
Quick Attach: none			
Maximum Force Exerted Through Whole Range:	6791 lbs	(30.2 kN)	*9306 lbs (41.4 kN)
i) Opening pressure of relief valve:	NA		
Sustained pressure with pump stalled:	2640 psi	(182 bar)	
ii) Pump delivery rate at minimum pressure and rated engine speed:	29.0 GPM	(109.8 l/min)	
iii) Pump delivery rate at maximum hydraulic power:	25.1 GPM	(95.0 l/min)	
Delivery pressure:	2150 psi	(148 bar)	
Power:	31.5 HP	(23.5 kW)	*with lift assist cylinders



Ford 8830 Powershift Diesel



	inch	mm
A	29.0	737
B	15.0	381
C	16.2	412
D	15.5	394
E	8.0	203
F	10.5	267
G	33.7	855
H	2.4	62
I	17.4	442
J	23.2	588
K	22.2	564
L	44.7	1135
M	23.0	584
N	35.7	906
O	9.1	231
P	50.2	1275
Q	33.6	853
R	34.9	886

HITCH DIMENSIONS AS TESTED—NO LOAD

Agricultural Research Division
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Darrell Nelson, Dean and Director

NEBRASKA OECD TRACTOR TEST 1649—SUMMARY 087
CASE INTERNATIONAL 9230 DIESEL
ALSO STEIGER 9230 DIESEL
12 SPEED

POWER TAKE-OFF PERFORMANCE

Power HP (kW)	Crank shaft speed rpm	Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Mean Atmospheric Conditions
MAXIMUM POWER AND FUEL CONSUMPTION					
Rated Engine Speed—(PTO speed—1048 rpm)					
198.63 (148.12)	2199	11.74 (44.44)	0.413 (0.251)	16.92 (3.33)	
Standard PTO Speed (PTO—1000 RPM)					
207.85 (154.99)	2097	11.85 (44.85)	0.399 (0.243)	17.54 (3.45)	
Maximum Power (2 Hours)					
218.20 (162.71)	1900	11.67 (44.18)	0.380 (0.231)	18.70 (3.68)	Air temperature
VARYING POWER AND FUEL CONSUMPTION					
198.63 (148.12)	2199	11.74 (44.44)	0.413 (0.251)	16.92 (3.33)	79°F (26°C)
174.25 (129.94)	2252	10.68 (40.44)	0.429 (0.261)	16.31 (3.21)	Relative humidity
131.59 (98.13)	2286	8.75 (33.11)	0.465 (0.283)	15.04 (2.96)	60%
89.44 (66.70)	2320	7.04 (26.63)	0.550 (0.335)	12.71 (2.50)	Barometer
44.28 (33.02)	2350	4.93 (18.68)	0.779 (0.474)	8.98 (1.77)	28.92" Hg (97.92 kPa)
0.38 (0.28)	2375	3.22 (12.18)	59.906 (36.437)	0.12 (0.02)	

Maximum Torque 628 lb-ft (852 Nm) at 1900 rpm
Maximum Torque Rise 32.4%

DRAWBAR PERFORMANCE
FUEL CONSUMPTION CHARACTERISTICS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp °F (°C) cool-ing med	Temp °F (°C) Air dry bulb	Barom inch Hg (kPa)
Maximum Power—5th Gear									
177.51 (132.37)	14127 (62.84)	4.71 (7.58)	2198	2.72	0.456 (0.278)	15.20 (3.01)	183 (84)	81 (27)	28.85 (97.69)
75% of Pull at Maximum Power—5th Gear									
138.50 (103.28)	10601 (47.16)	4.90 (7.88)	2208	2.14	0.493 (0.300)	14.18 (2.79)	181 (83)	88 (31)	28.81 (97.56)
50% of Pull at Maximum Power—5th Gear									
94.45 (70.43)	7059 (31.40)	5.02 (8.08)	2305	1.31	0.567 (0.345)	12.34 (2.43)	182 [illegible]	88 [illegible]	28.81 (97.56)
75% of Pull at Reduced Engine Speed—4th Gear									
138.40 (103.20)	10599 (47.14)	4.90 (7.88)	1842	1.98	0.441 (0.268)	15.86 (3.12)	183 (84)	88 (31)	28.81 (97.56)
50% of Pull at Reduced Engine Speed—4th Gear									
94.31 (70.32)	7060 (31.40)	5.01 (8.06)	1870	1.31	0.482 (0.293)	14.50 (2.86)	181 (83)	88 (31)	28.81 (97.56)

Location of Test: Tractor Testing Laboratory, University of Nebraska, Lincoln, Nebraska 68583-0832, U.S.A.

Dates of Test: June 10-14, 1991

Manufacturer: J.I. CASE CO. 3401 First Avenue North, Fargo ND 58102

FUEL OIL and TIME: Fuel No. 2 Diesel **Cetane** *No.* 55.9 **Specific gravity converted to 60°/60°F** *(15°/15°C)* 0.8399 **Fuel weight** 6.995 lbs/gal *(0.838 kg/l)* **Oil SAE** 15W-40 **API service classification** CC, CD **To motor** 4.343 gal *(16.440 l)* **Drained from motor** 3.886 gal *(14.711 l)* **Transmission and final drive lubricant** Case IH Hytran Plus fluid **Hydraulic lubricant** Case IH Hytran Plus fluid **Total time engine was operated** 21.0 hours.

ENGINE: Make Consolidated Diesel Corporation Diesel **Type** six cylinder vertical with turbocharger and intercooler **Serial No.** 44577092 **Crankshaft** lengthwise **Rated rpm** 2200 **Bore and stroke** (as specified) 4.488" × 5.315" *(114.0 mm × 135.0 mm)* **Compression ratio** 16.5 to 1 **Displacement** 505 cu in *(8269 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements and aspirator **Oil filter** one full flow cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** one paper element **Muffler** vertical **Cooling medium temperature control** two thermostats.

ENGINE OPERATING PARAMETERS: Fuel rate 75.6-83.8 lb/hr *(34.3-38.0 kg/hr)* **High idle** 2350-2450 rpm **Turbo boost** nominal 12-15.5 psi *(81-106 kPa)* as measured 15.5 psi *(106 kPa)*.

CHASSIS: Type four wheel drive with duals, articulated **Serial No.** *JCB0027357 **Tread width** rear 60.0" *(1524 mm)* to 130.0" *(3302 mm)* front 60.0" *(1524 mm)* to 130.0" *(3302 mm)* **Wheel base** 120.4" *(3058 mm)* **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with full range operator controlled powershift **Nominal travel speeds mph (km/h)** first 2.17 *(3.50)* second 2.63 *(4.24)* third 3.24 *(5.21)* fourth 3.93 *(6.33)* fifth 4.76 *(7.66)* sixth 5.86 *(9.43)* seventh 6.92 *(11.13)* eighth 8.37 *(13.47)* ninth 10.30 *(16.58)* tenth 12.51 *(20.13)* eleventh 15.14 *(24.36)* twelfth 18.64 *(29.99)* reverse 2.85 *(4.58)*, 5.15 *(8.28)*, 9.05 *(14.56)* **Clutch** multiple wet disc hydraulically power actuated by foot pedal **Brakes** caliper disc hydraulically operated by foot pedal **Steering** hydrostatic and articulated **Power take-off** 1000 rpm at 2098 engine rpm **Unladen tractor mass** 24106 lb *(10934 kg)*.

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

DRAWBAR PERFORMANCE
MAXIMUM POWER IN SELECTED GEARS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temp °F (°C) cool-ing med	Air dry bulb	Barom. inch Hg (kPa)
				2nd Gear					
[illegible].74 (122.10)	25061 (111.47)	2.45 (3.94)	2223	9.45	0.492 (0.299)	14.21 (2.80)	182 (83)	76 (24)	28.75 (97.36)
				3rd Gear					
178.54 (133.14)	23717 (105.50)	2.82 (4.54)	2016	8.09	0.463 (0.282)	15.09 (2.97)	183 (84)	76 (24)	28.75 (97.36)
				4th Gear					
189.20 (141.09)	21714 (96.59)	3.27 (5.26)	1903	5.70	0.437 (0.266)	16.01 (3.15)	184 (84)	76 (24)	28.75 (97.36)
				5th Gear					
191.67 (142.93)	17867 (79.48)	4.02 (6.47)	1900	3.92	0.432 (0.263)	16.18 (3.19)	185 (85)	82 (28)	28.83 (97.63)
				6th Gear					
193.41 (144.23)	14539 (64.67)	4.99 (8.03)	1895	2.88	0.428 (0.260)	16.35 (3.22)	186 (86)	83 (28)	28.83 (97.63)
				7th Gear					
193.41 (144.23)	12198 (54.26)	5.95 (9.57)	1902	2.31	0.427 (0.260)	16.38 (3.23)	188 (86)	84 (29)	28.83 (97.63)
				8th Gear					
192.83 (143.80)	10013 (44.54)	7.22 (11.62)	1900	1.81	0.431 (0.262)	16.22 (3.20)	187 (86)	86 (30)	28.82 (97.60)
				9th Gear					
192.73 (143.72)	8091 (35.99)	8.93 (14.38)	1900	1.65	0.431 (0.262)	16.24 (3.20)	188 (87)	88 (31)	28.82 (97.60)

TRACTOR SOUND LEVEL WITH CAB	dB(A)
Gear closest to 4.7 mph *(7.5 km/h)* 5th gear	78.0
Maximum Sound Level 4th gear	80.0
Transport speed—no load 12th gear	76.5
Bystander	—

TIRES AND WEIGHT	**Tested Without Ballast**
Rear Tires—No., size, ply & psi *(kPa)*	Four 18.4R38; * inner 14 *(95)* outer 12 *(83)*
Front Tires—No., size, ply & psi *(kPa)*	Four 18.4R38; * inner 14 *(95)* outer 12 *(83)*
Height of Drawbar	13.5 in *(343 mm)*
Static Weight with Operator—Rear	11172 lb *(5140 kg)*
—Front	12500 lb *(5670 kg)*
—Total	23272 lb *(10810 kg)*

REMARKS: All test results were determined from observed data obtained in accordance with official OECD, SAE and Nebraska test procedures. For the maximum power tests, the fuel temperature at the injection pump inlet was maintained at 130° F *(54° C)*. The drawbar pull in 2nd gear was limited to avoid tractor bouncing. The performance figures on this summary were taken from a test conducted under the OECD Code II restricted standard test code procedure.

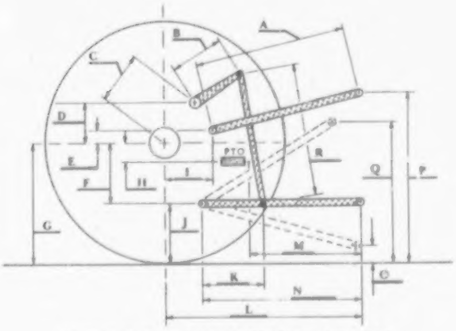
We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1649**, Summary 087, August 20, 1991.

LOUIS I. LEVITICUS
Engineer-in-Charge

K. VON BARGEN
R. D. GRISSO
G. J. HOFFMAN
Board of Tractor Test Engineers

THREE POINT HITCH PERFORMANCE
(OECD Static Test)

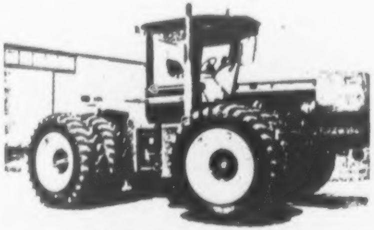
CATEGORY: III	
Quick Attach: yes	
Maximum Force Exerted Through Whole Range:	12942 lbs *(57.5 kN)*
i) Opening pressure of relief valve:	NA
Sustained pressure at compensator cutoff:	2550 psi *(176 bar)*
ii) Pump delivery rate at minimum pressure:	29.0 GPM *(109.8 l/min)*
iii) Pump delivery rate at maximum hydraulic power:	24.9 GPM *(94.3 l/min)*
Delivery pressure:	2350 psi *(162 bar)*
Power:	34.1 HP *(25.5 kW)*



HITCH DIMENSIONS AS TESTED—NO LOAD

	inch	mm
A	29.1	*740*
B	21.0	*533*
C	25.6	*651*
D	25.1	*637*
E	11.4	*289*
F	9.9	*251*
G	32.3	*820*
H	2.2	*56*
I	22.8	*579*
J	22.4	*569*
K	23.0	*584*
L	52.2	*1326*
L'	57.2	*1453*
M	20.0	*508*
N	42.0	*1067*
O	5.2	*132*
P	44.4	*1128*
Q	37.6	*956*
R	37.8	*959*

L' to end of Quick Attach



Case International 9230 Diesel

Agricultural Research Division
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Darrell Nelson, Dean and Director

NEBRASKA OECD TRACTOR TEST 1650—SUMMARY 088
CASE INTERNATIONAL 9240 DIESEL
ALSO STEIGER 9240 DIESEL
12 SPEED

POWER TAKE-OFF PERFORMANCE

Power HP (kW)	Crank shaft speed rpm	Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)
MAXIMUM POWER AND FUEL CONSUMPTION				
Rated Engine Speed—(PTO speed—1048 rpm)				
200.53 *(149.55)*	2199	11.68 *(44.20)*	0.407 *(0.248)*	17.17 *(3.38)*
Standard Power Take-off Speed (1000 RPM)				
212.08 *(158.15)*	2098	11.88 *(44.99)*	0.392 *(0.238)*	17.85 *(3.52)*
Maximum Power (2 Hours)				
215.87 *(160.97)*	2001	11.81 *(44.71)*	0.381 *(0.232)*	18.28 *(3.60)*
VARYING POWER AND FUEL CONSUMPTION				
200.53 *(149.55)*	2199	11.68 *(44.20)*	0.407 *(0.248)*	17.17 *(3.38)*
177.18 *(132.12)*	2290	10.85 *(41.06)*	0.428 *(0.261)*	16.32 *(3.22)*
130.36 *(97.21)*	2323	8.92 *(33.76)*	0.479 *(0.291)*	14.61 *(2.88)*
87.70 *(65.40)*	2355	6.86 *(25.96)*	0.547 *(0.333)*	12.78 *(2.52)*
45.49 *(33.92)*	2380	5.11 *(19.35)*	0.785 *(0.477)*	8.91 *(1.76)*
0.16 *(0.12)*	2407	3.76 *(14.23)*	31.781 *([illegible])*	0.20 *(0.04)*

Mean Atmospheric Conditions

Air temperature

71°F (22°C)

Relative humidity

83%

Barometer

28.91" Hg (98.02 kPa)

Maximum Torque 603 lb.-ft. *(818 Nm)* at 1091 rpm
Maximum Torque Rise 26.0%

DRAWBAR PERFORMANCE
FUEL CONSUMPTION CHARACTERISTICS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp °F (°C) cooling med	Temp °F (°C) Air dry bulb	Barom. inch Hg (kPa)
Maximum Power—5th Gear									
175.89 *(131.16)*	13540 *(59.74)*	4.94 *(7.96)*	2202	2.38	0.466 *(0.283)*	15.00 *(2.96)*	181 *(83)*	70 *(21)*	28.95 *(98.04)*
75% of Pull at Maximum Power—5th Gear									
137.75 *(102.72)*	10008 *(44.51)*	5.16 *(8.31)*	2287	1.78	0.511 *(0.311)*	13.70 *(2.70)*	185 *(84)*	88 *(31)*	28.87 *(97.77)*
50% of Pull at Maximum Power—5th Gear									
93.83 *(69.97)*	6672 *(29.68)*	5.27 *(8.49)*	2325	1.25	0.591 *(0.359)*	11.84 *(2.33)*	180 *(82)*	88 *(31)*	28.87 *(97.77)*
75% of Pull at Reduced Engine Speed—6th Gear									
137.78 *(102.74)*	10002 *(44.49)*	5.17 *(8.32)*	1860	1.78	0.451 *(0.274)*	15.49 *(3.05)*	182 *(83)*	88 *(31)*	28.87 *(97.77)*
50% of Pull at Reduced Engine Speed—6th Gear									
93.97 *(70.07)*	6672 *(29.68)*	5.28 *(8.50)*	1892	1.16	0.508 *(0.309)*	13.78 *(2.71)*	179 *(82)*	88 *(31)*	28.87 *(97.77)*

Location of Test: Tractor Testing Laboratory, University of Nebraska, Lincoln, Nebraska 68583-0832, U.S.A.

Dates of Test: June 5-14, 1991

Manufacturer: J.I. CASE CO. 3401 First Avenue North, Fargo ND 58102

FUEL OIL and TIME: Fuel No. 2 Diesel **Cetane No.** 53.9 **Specific gravity converted to 60°/60°F** *(15°/15°C)* 0.8399 **Fuel weight** 6.993 lbs/gal *(0.838 kg/l)* **Oil SAE** 15W-40 **API service classification** CE, CD **To motor** 4.670 gal *(17.677 l)* **Drained from motor** 3.987 gal *(15.094 l)* **Transmission and final drive lubricant** Case IH Hytran Plus fluid **Hydraulic lubricant** Case IH Hytran Plus fluid **Total time engine was operated** 42.0 hours

ENGINE: Make Consolidated Diesel Corporation Diesel **Type** six cylinder vertical with turbocharger and intercooler **Serial No.** *44598515* **Crankshaft** lengthwise **Rated rpm** 2200 **Bore and stroke** (as specified) 4.488" × 5.315" *(114.0 mm × 135.0 mm)* **Compression ratio** 16.5 to 1 **Displacement** 505 cu in *(8269 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements and aspirator **Oil filter** one full flow cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** one paper element **Muffler** vertical **Cooling medium temperature control** two thermostats

ENGINE OPERATING PARAMETERS: Fuel rate 75.6-83.8 lb/hr *(34.3-38.0 kg/hr)* **High idle** 2350-2450 rpm **Turbo boost** nominal 12-15.5 psi *(81-106 kPa)* as measured 15.5 psi *(106 kPa)*

CHASSIS: Type four wheel drive with duals, rigid frame **Serial No.** JCB0027368 **Tread width** rear 84.0" *(2135 mm)* and 139.7" *(3550 mm)* front 84.0" *(2135 mm)* to 139.7" *(3550 mm)* **Wheel base** 124.0" *(3150 mm)* **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with full range operator controlled powershift **Nominal travel speeds mph (km/h)** first 2.25 *(3.62)* second 2.73 *(4.39)* third 3.36 *(5.40)* fourth 4.07 *(6.55)* fifth 4.93 *(7.93)* sixth 6.06 *(9.76)* seventh 7.16 *(11.52)* eighth 8.66 *(13.94)* ninth 10.66 *(17.16)* tenth 12.95 *(20.84)* eleventh 15.67 *(25.21)* twelfth 19.28 *(31.03)* reverse 2.95 *(4.74)*, 5.33 *(8.57)*, 9.36 *(15.06)* **Clutch** multiple wet disc hydraulically power actuated by foot pedal **Brakes** caliper disc hydraulically operated by foot pedal **Steering** hydrostatic for front wheels, electrohydraulic for rear wheels. Front and rear wheels may be steered independently or together **Power take-off** 1000 rpm at 2098 engine rpm **Unladen tractor mass** 28214 lb *(12798 kg)*

DRAWBAR PERFORMANCE
MAXIMUM POWER IN SELECTED GEARS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp °F (°C) cooling med	Temp °F (°C) Air dry bulb	Barom. inch Hg (kPa)
1st Gear									
160.76 *(119.88)*	28747 *(127.87)*	2.10 *(3.38)*	2240	10.86	0.507 *(0.308)*	13.79 *(2.72)*	180 *(82)*	71 *(22)*	28.92 *(97.93)*
2nd Gear									
173.93 *(129.70)*	27039 *(120.27)*	2.41 *(3.88)*	2002	8.80	0.480 *(0.292)*	14.58 *(2.87)*	181 *(83)*	77 *(25)*	28.92 *(97.93)*
3rd Gear									
184.90 *(137.88)*	23353 *(103.88)*	2.97 *(4.78)*	2001	5.14	0.452 *(0.275)*	15.47 *(3.05)*	181 *(83)*	78 *(26)*	28.92 *(97.93)*
4th Gear									
187.32 *(139.68)*	19164 *(85.25)*	3.67 *(5.90)*	2002	3.65	0.445 *(0.271)*	15.70 *(3.09)*	182 *(83)*	79 *(26)*	28.92 *(97.93)*
5th Gear									
190.31 *(141.91)*	15956 *(70.98)*	4.47 *(7.20)*	2000	2.72	0.437 *(0.266)*	16.01 *(3.15)*	182 *(83)*	70 *(21)*	28.95 *(98.04)*
6th Gear									
188.54 *(140.59)*	12767 *(56.79)*	5.54 *(8.91)*	2002	2.50	0.442 *(0.269)*	15.82 *(3.12)*	181 *(83)*	71 *(22)*	28.94 *(98.00)*
7th Gear									
187.42 *(139.76)*	10728 *(47.72)*	6.55 *(10.54)*	2001	1.86	0.445 *(0.271)*	15.72 *(3.10)*	182 *(83)*	71 *(22)*	28.94 *(98.00)*
8th Gear									
185.74 *(138.50)*	8746 *(38.90)*	7.96 *(12.82)*	2002	1.60	0.451 *(0.274)*	15.52 *(3.06)*	184 *(84)*	80 *(27)*	28.92 *(97.93)*
9th Gear									
181.86 *(135.61)*	6929 *(30.82)*	9.84 *(15.84)*	2004	1.25	0.457 *(0.278)*	15.29 *(3.01)*	184 *(84)*	81 *(27)*	28.92 *(97.93)*

TRACTOR SOUND LEVEL WITH CAB	dB(A)
Gear closest to 4.7 mph *(7.5 km/h)* 5th gear	74.0
Maximum Sound Level 8th gear	76.5
Transport speed—no load 12th gear	76.5
Bystander	—

TIRES AND WEIGHT		Tested Without Ballast
Rear Tires	—No., size, ply & psi *(kPa)*	Four 20.8R38; *; 14 *(95)* outer 12 *(83)*
Front Tires	—No., size, ply & psi *(kPa)*	Four 20.8R38; *; 14 *(95)* outer 12 *(83)*
Height of Drawbar		14.5 in. *(370 mm)*
Static Weight with Operator	—Rear	13784 lb. *(6252 kg)*
	—Front	14596 lb. *(6621 kg)*
	—Total	28380 lb. *(12873 kg)*

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with official OECD, SAE and Nebraska test procedures. For the maximum power tests, the fuel temperature at the injection pump inlet was maintained at 190° F *(94° C)*. The drawbar pull in 1st gear was limited to avoid tractor bouncing. The performance figures on this summary were taken from a test conducted under the OECD Code II restricted standard test code procedure.

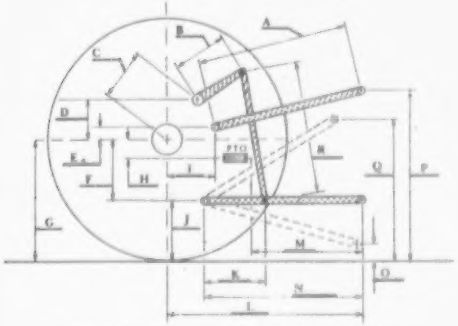
We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1650**, Summary 088, October 17, 1991.

LOUIS I. LEVITICUS
Engineer-in-Charge

K. VON BARGEN
R. D. GRISSO
L. L. BASHFORD
Board of Tractor Test Engineers

THREE POINT HITCH PERFORMANCE
(OECD Static Test)

CATEGORY	III
Quick Attach	yes
Maximum Force Exerted Through Whole Range	13212 lbs (58.8 kN)
i) Opening pressure of relief valve	NA
Sustained pressure at compensator cutoff	2550 psi (176 bar)
ii) Pump delivery rate at minimum pressure	29.1 GPM (110.2 l/min)
iii) Pump delivery rate at maximum hydraulic power	25.3 GPM (95.8 l/min)
Delivery pressure	2350 psi (162 bar)
Power	34.7 HP (25.9 kW)



HITCH DIMENSIONS AS TESTED—NO LOAD

	inch	mm
A	29.3	744
B	21.0	533
C	26.3	667
D	25.1	637
E	11.4	289
F	9.9	251
G	33.7	855
H	2.2	56
I	25.3	642
J	23.8	604
K	23.0	584
L	54.7	1389
L'	59.7	1516
M	25.0	635
N	42.0	1067
O	6.6	167
P	45.8	1163
Q	38.3	972
R	37.5	953

L' to end of Quick Attach

Case International 9240 Diesel

Agricultural Research Division
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Darrell Nelson, Dean and Director

NEBRASKA OECD TRACTOR TEST 1651—SUMMARY 096
CASE INTERNATIONAL 9250 DIESEL
ALSO STEIGER 9250 DIESEL
12 SPEED

POWER TAKE-OFF PERFORMANCE

Power HP (kW)	Crank shaft speed rpm	Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Mean Atmospheric Conditions
MAXIMUM POWER AND FUEL CONSUMPTION					
Rated Engine Speed—(PTO speed—1000 rpm)					
266.01 (198.37)	2100	14.63 (55.38)	0.384 (0.234)	18.18 (3.58)	
Maximum Power (2 Hours)					
271.01 (202.09)	1968	14.31 (54.16)	0.369 (0.224)	18.94 (3.73)	
VARYING POWER AND FUEL CONSUMPTION					Air temperature
266.01 (198.37)	2100	14.63 (55.38)	0.384 (0.234)	18.18 (3.58)	74°F (23°C)
237.66 (177.22)	2202	13.82 (52.31)	0.406 (0.247)	17.20 (3.39)	Relative humidity
180.05 (134.26)	2230	11.42 (43.22)	0.443 (0.270)	15.77 (3.11)	26%
121.01 (90.24)	2251	9.18 (34.75)	0.531 (0.323)	13.18 (2.60)	Barometer
61.22 (45.65)	2278	6.52 (24.69)	0.745 (0.453)	9.38 (1.85)	29.35" Hg (99.40 kPa)
1.05 (0.78)	2320	4.07 (15.41)	27.087 (16.477)	0.26 (0.05)	

Maximum Torque 829 lb-ft (1124 Nm) at 1290 rpm
Maximum Torque Rise 24.6%

DRAWBAR PERFORMANCE
FUEL CONSUMPTION CHARACTERISTICS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp. °F (°C) cooling med	Temp. °F (°C) Air dry bulb	Barom. inch Hg (kPa)
Maximum Power—5th Gear									
237.29 (176.95)	17800 (79.18)	5.00 (8.05)	2102	2.54	0.428 (0.260)	16.33 (3.22)	171 (77)	51 (11)	29.09 (98.51)
75% of Pull at Maximum Power—5th Gear									
189.40 (141.24)	13388 (59.55)	5.31 (8.54)	2220	1.99	0.475 (0.289)	14.77 (2.91)	173 (78)	63 (17)	29.09 (98.51)
50% of Pull at Maximum Power—5th Gear									
128.62 (95.91)	8917 (39.66)	5.41 (8.70)	2249	1.44	0.564 (0.343)	12.39 (2.44)	171 (77)	63 (17)	29.09 (98.51)
75% of Pull at Reduced Engine Speed—6th Gear									
188.81 (140.79)	13376 (59.50)	5.29 (8.52)	1799	1.99	0.419 (0.255)	16.69 (3.29)	173 (78)	63 (17)	29.09 (98.51)
50% of Pull at Reduced Engine Speed—6th Gear									
128.45 (95.78)	8909 (39.63)	5.41 (8.70)	1827	1.35	0.453 (0.276)	15.42 (3.04)	171 (77)	63 (17)	29.09 (98.51)

Location of Test: Tractor Testing Laboratory, University of Nebraska, Lincoln, Nebraska 68583-0832, U.S.A.

Dates of Test: September 19-25, 1991

Manufacturer: J.I. CASE CO. 3401 First Avenue North, Fargo ND 58102

FUEL OIL and TIME: Fuel No. 2 Diesel **Cetane No.** 53.9 **Specific gravity converted to 60°/60°F** *(15°/15°C)* 0.8395 **Fuel weight** 6.990 lbs/gal *(0.838 kg/l)* **Oil SAE** 15W-40 **API service classification** CE, CD **To motor** 8.967 gal *(33.943 l)* **Drained from motor** 8.716 gal *(32.992 l)* **Transmission and final drive lubricant** Case IH Hytran Plus fluid **Hydraulic lubricant** Case IH Hytran Plus fluid **Total time engine was operated** 21.0 hours.

ENGINE: Make Cummins Diesel **Type** six cylinder vertical with turbocharger and intercooler **Serial No.** 11618103 **Crankshaft** lengthwise **Rated rpm** 2100 **Bore and stroke** (as specified) 4.921" × 5.354" *(125.0 mm × 136.0 mm)* **Compression ratio** 16.0 to 1 **Displacement** 611 cu in *(10008 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements and aspirator **Oil filter** one full flow cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** one paper element **Muffler** vertical **Cooling medium temperature control** thermostat.

ENGINE OPERATING PARAMETERS: Fuel rate 99.0-104.0 lb/hr *(44.9-47.2 kg/hr)* **High idle** 2250-2350 rpm **Turbo boost** nominal 21-26 psi *(149-176 kPa)* as measured 19.5 psi *(134 kPa)*.

CHASSIS: Type four wheel drive with duals, articulated **Serial No.** JCB0027278 **Tread width** rear 60.0" *(1524 mm)* to 130.0" *(3302 mm)* front 60.0" *(1524 mm)* to 130.0" *(3302 mm)* **Wheel base** 130.0" *(3302 mm)* **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with full range operator controlled powershift **Nominal travel speeds mph (km/h)** first 2.32 *(3.74)* second 2.81 *(4.52)* third 3.45 *(5.56)* fourth 4.20 *(6.76)* fifth 5.08 *(8.17)* sixth 6.25 *(10.06)* seventh 7.38 *(11.88)* eighth 8.93 *(14.37)* ninth 10.99 *(17.69)* tenth 13.35 *(21.48)* eleventh 16.16 *(26.00)* twelfth 19.88 *(32.00)* reverse 3.04 *(4.89)*, 5.49 *(8.84)*, 9.65 *(15.53)* **Clutch** multiple wet disc hydraulically power actuated by foot pedal **Brakes** caliper disc hydraulically operated by foot pedal **Steering** hydrostatic **Power take-off** 1000 rpm at 2098 engine rpm **Unladen tractor mass** 30000 lb *(13615 kg)*.

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

DRAWBAR PERFORMANCE
MAXIMUM POWER IN SELECTED GEARS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp °F (°C) cool-ing med	Temp °F (°C) Air dry bulb	Barom. inch Hg (kPa)
				1st Gear					
195.60 (145.86)	32363 (143.96)	2.24 (3.61)	2200	8.87	0.488 (0.297)	14.82 (2.92)	169 (76)	52 (11)	29.12 (98.61)
				2nd Gear					
221.55 (165.21)	31046 (138.10)	2.67 (4.30)	2156	7.18	0.452 (0.275)	15.48 (3.05)	171 (77)	52 (11)	29.19 (98.85)
				3rd Gear					
233.08 (173.81)	27855 (123.91)	3.14 (5.05)	1995	5.09	0.433 (0.263)	16.13 (3.18)	172 (78)	52 (11)	29.14 (98.68)
				4th Gear					
234.81 (175.10)	23191 (103.16)	3.80 (6.11)	1955	3.52	0.426 (0.259)	16.41 (3.23)	171 (77)	51 (11)	29.11 (98.58)
				5th Gear					
240.68 (179.47)	19519 (86.82)	4.62 (7.44)	1950	2.65	0.414 (0.252)	16.89 (3.33)	172 (78)	51 (11)	29.07 (98.44)
				6th Gear					
239.41 (178.53)	15705 (69.86)	5.72 (9.20)	1950	2.36	0.416 (0.253)	16.80 (3.31)	172 (78)	55 (13)	29.15 (98.71)
				7th Gear					
239.53 (178.62)	13239 (58.89)	6.79 (10.92)	1954	2.17	0.416 (0.253)	16.81 (3.31)	173 (78)	55 (13)	29.15 (98.71)
				8th Gear					
237.20 (176.88)	10809 (48.08)	8.23 (13.24)	1952	1.62	0.421 (0.256)	16.59 (3.27)	172 (78)	55 (13)	29.15 (98.71)

TRACTOR SOUND LEVEL WITH CAB	dB(A)
Gear chosen to 4.7 mph (7.5 km/h) 5th gear	78.0
Maximum Sound Level—1st gear	79.0
Transport speed—no load 12th gear	78.5
Bystander	—

TIRES AND WEIGHT		Tested Without Ballast
Rear Tires	—No., size, ply & psi (kPa)	Four 20.8R42; ** stars; 14 (97) inner; 12 (83) outer
Front Tires	—No., size, ply & psi (kPa)	Four 20.8R42; ** stars; 14 (97) inner; 12 (83) outer
Height of Drawbar		16.5 in. (420 mm)
Static Weight with operator	—Rear	15695 lb (7117 kg)
	—Front	16530 lb (7498 kg)
	—Total	32225 lb (14617 kg)

REMARKS: All test results were determined from observed data obtained in accordance with official OECD, SAE and Nebraska test procedures. For the maximum power tests, the fuel temperature at the injection pump inlet was maintained at 131° F (55° C). The drawbar pull in 1st gear was limited to avoid tractor bouncing. The performance figures on this summary were taken from a test conducted under the OECD Code II restricted standard test code procedure.

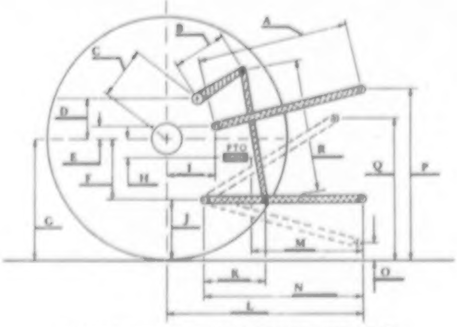
We, the undersigned, certify that this is a true and correct report of official Tractor Test No. 1651, Summary 096, October 17, 1991.

LOUIS L. LEVITICUS
Engineer-in-Charge

R. VON BARGEN
R. D. GRISSO
L. L. BASHFORD
Board of Tractor Test Engineers

THREE POINT HITCH PERFORMANCE
(OECD Static Test)

CATEGORY:	III
Quick Attach:	yes
Maximum Force Exerted Through Whole Range:	12942 lbs (57.6 kN)
i) Opening pressure of relief valve:	NA
Sustained pressure at compensator cutoff:	2500 psi (172 bar)
ii) Pump delivery rate at minimum pressure:	27.8 GPM (105.2 l/min)
iii) Pump delivery rate at maximum hydraulic power:	24.1 GPM (91.2 l/min)
Delivery pressure:	2300 psi (159 bar)
Power:	32.3 HP (24.1 kW)



HITCH DIMENSIONS AS TESTED—NO LOAD

	inch	mm
A	29.1	740
B	21.0	533
C	25.6	651
D	25.1	637
E	11.4	289
F	9.9	251
G	36.1	917
H	2.2	56
I	22.8	579
J	26.2	666
K	23.0	584
L	52.2	1326
L'	57.2	1453
M	25.0	636
N	42.0	1067
O	9.0	229
P	48.2	1225
Q	41.5	1053
R	37.8	959

L' to end of Quick Attach

Case International 9250 Diesel

Agricultural Research Division
Institute of Agriculture and Natural Resources
University of Nebraska-Lincoln
Darrell Nelson, Dean and Director

NEBRASKA OECD TRACTOR TEST 1652—SUMMARY 097
CASE INTERNATIONAL 9260 DIESEL
ALSO STEIGER 9260 DIESEL
12 SPEED

POWER TAKE-OFF PERFORMANCE

Power HP (kW)	Crank shaft speed rpm	Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Mean Atmospheric Conditions
MAXIMUM POWER AND FUEL CONSUMPTION					
Rated Engine Speed—(PTO speed—999 rpm)					
265.84 *(198.24)*	2098	14.73 *(55.74)*	0.387 *(0.236)*	18.05 *(3.56)*	
Maximum Power (2 Hours)					
270.26 *(201.53)*	2000	14.60 *(55.26)*	0.378 *(0.230)*	18.51 *(3.65)*	Air temperature
VARYING POWER AND FUEL CONSUMPTION					
265.84 *(198.24)*	2098	14.73 *(55.74)*	0.387 *(0.236)*	18.05 *(3.56)*	75°F *(24°C)*
234.65 *(174.98)*	2192	13.86 *(52.48)*	0.413 *(0.251)*	16.93 *(3.33)*	Relative humidity
178.61 *(133.19)*	2222	11.42 *(43.22)*	0.447 *(0.272)*	15.65 *(3.08)*	51%
119.66 *(89.23)*	2241	8.63 *(32.66)*	0.504 *(0.307)*	13.87 *(2.73)*	Barometer
60.64 *(45.22)*	2266	6.65 *(25.18)*	0.767 *(0.466)*	9.12 *(1.80)*	29.23" Hg *(98.99 kPa)*
0.78 *(0.58)*	2301	4.16 *(15.76)*	37.186 *(22.620)*	0.19 *(0.04)*	

Maximum Torque 984 lb.-ft. *(1334 Nm)* at 1296 rpm
Maximum Torque Rise 47.8%

DRAWBAR PERFORMANCE
FUEL CONSUMPTION CHARACTERISTICS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp °F (°C) cool-ing med	Temp °F (°C) Air dry bulb	Barom. inch Hg (kPa)
Maximum Power—5th Gear									
236.13 *(176.08)*	17841 *(79.36)*	4.96 *(7.99)*	2098	2.45	0.436 *(0.265)*	16.07 *(3.17)*	169 *(76)*	54 *(12)*	29.30 *(99.22)*
75% of Pull at Maximum Power—5th Gear									
187.49 *(139.81)*	13420 *(59.70)*	5.24 *(8.43)*	2204	2.09	0.481 *(0.293)*	14.53 *(2.86)*	171 *(77)*	67 *(19)*	29.20 *(98.88)*
50% of Pull at Maximum Power—5th Gear									
127.67 *(95.21)*	8952 *(39.82)*	5.35 *(8.61)*	2237	1.44	0.571 *(0.347)*	12.25 *(2.41)*	166 *(74)*	67 *(19)*	29.20 *(98.88)*
75% of Pull at Reduced Engine Speed—6th Gear									
187.65 *(139.93)*	13437 *(59.77)*	5.24 *(8.43)*	1790	1.99	0.421 *(0.256)*	16.59 *(3.27)*	171 *(77)*	68 *(20)*	29.10 *(98.54)*
50% of Pull at Reduced Engine Speed—6th Gear									
127.53 *(95.10)*	8940 *(39.76)*	5.35 *(8.61)*	1817	1.44	0.458 *(0.279)*	15.25 *(3.00)*	164 *(73)*	68 *(20)*	29.10 *(98.54)*

Location of Test: Tractor Testing Laboratory, University of Nebraska, Lincoln, Nebraska 68583-0832, U.S.A.

Dates of Test: September 17-26, 1991

Manufacturer: J I CASE CO. 3401 First Avenue North, Fargo ND 58102

FUEL OIL and TIME: Fuel No. 2 Diesel **Cetane No.** 53.9 **Specific gravity converted to 60°/60°F** *(15°/15°C)* 0.8395 **Fuel weight** 6.990 lbs/gal *(0.838 kg/l)* **Oil SAE** 15W-40 **API service classification** CE, CD **To motor** 8.806 gal *(33.334 l)* **Drained from motor** 8.459 gal *(32.021 l)* **Transmission and final drive lubricant** Case IH Hytran Plus fluid **Hydraulic lubricant** Case IH Hytran Plus fluid **Total time engine was operated** 22.0 hours

ENGINE: Make Cummins Diesel **Type** six cylinder vertical with turbocharger and intercooler **Serial No.** 34642428 **Crankshaft** lengthwise **Rated rpm** 2100 **Bore and stroke** (as specified) 4.921" × 5.354" *(125.0 mm × 136.0 mm)* **Compression ratio** 16.0 to 1 **Displacement** 611 cu in *(10000 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements and aspirator **Oil filter** one full flow cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** one paper element **Muffler** vertical **Cooling medium temperature control** thermostat

ENGINE OPERATING PARAMETERS: Fuel rate 99.0-104.0 lb/hr *(44.9-47.2 kg/hr)* **High idle** 2250-2350 rpm **Turbo boost** nominal 21-26 psi *(149-176 kPa)* as measured 20.0 psi *(138 kPa)*

CHASSIS: Type four wheel drive with duals, rigid frame **Serial No.** JCB0022218 **Tread width** rear 84.0" *(2135 mm)* and 139.7" *(3550 mm)* front 84.0" *(2135 mm)* and 139.7" *(3550 mm)* **Wheel base** 124.0" *(3150 mm)* **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with full range operator controlled powershift **Nominal travel speeds mph (km/h)** first 2.31 *(3.72)* second 2.79 *(4.49)* third 3.44 *(5.53)* fourth 4.17 *(6.71)* fifth 5.05 *(8.12)* sixth 6.21 *(9.99)* seventh 7.33 *(11.80)* eighth 8.87 *(14.27)* ninth 10.92 *(17.57)* tenth 13.25 *(21.33)* eleventh 16.04 *(25.81)* twelfth 19.74 *(31.77)* reverse 3.01 *(4.85)*, 5.45 *(8.77)*, 9.58 *(15.42)* **Clutch** multiple wet disc hydraulically power actuated by foot pedal **Brakes** caliper disc hydraulically operated by foot pedal **Steering** hydrostatic for front wheels, electrohydraulic for rear wheels. Front and rear wheels may be steered independently or together **Power take-off** 1000 rpm at 2098 engine rpm **Unladen tractor mass** 30135 lb *(13669 kg)*

DRAWBAR PERFORMANCE
MAXIMUM POWER IN SELECTED GEARS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp °F (°C) cool-ing med	Temp °F (°C) Air dry bulb	Barom. inch Hg (kPa)
1st Gear									
186.26 *(138.90)*	31618 *(140.64)*	2.21 *(3.56)*	2200	9.45	0.491 *(0.299)*	14.24 *(2.80)*	166 *(74)*	60 *(16)*	29.29 *(99.19)*
2nd Gear									
212.58 *(158.52)*	29551 *(131.45)*	2.70 *(4.34)*	2159	6.86	0.482 *(0.293)*	14.51 *(2.86)*	169 *(76)*	63 *(17)*	29.28 *(99.15)*
3rd Gear									
230.75 *(172.06)*	27406 *(121.91)*	3.16 *(5.08)*	2019	5.27	0.436 *(0.265)*	16.04 *(3.16)*	171 *(77)*	63 *(17)*	29.28 *(99.15)*
4th Gear									
237.48 *(177.09)*	22993 *(102.28)*	3.87 *(6.23)*	2001	3.44	0.429 *(0.261)*	16.30 *(3.21)*	170 *(77)*	56 *(13)*	29.30 *(99.22)*
5th Gear									
241.15 *(179.82)*	19078 *(84.86)*	4.74 *(7.62)*	2086	2.54	0.421 *(0.256)*	16.60 *(3.27)*	169 *(76)*	52 *(11)*	29.30 *(99.22)*
6th Gear									
240.71 *(179.50)*	15462 *(68.78)*	5.84 *(9.40)*	1998	2.27	0.420 *(0.255)*	16.64 *(3.28)*	171 *(77)*	56 *(13)*	29.30 *(99.22)*
7th Gear									
240.38 *(179.25)*	13009 *(57.87)*	6.93 *(11.15)*	2004	2.09	0.426 *(0.259)*	16.38 *(3.23)*	171 *(77)*	57 *(14)*	29.30 *(99.22)*
8th Gear									
236.66 *(176.48)*	10575 *(47.04)*	8.39 *(13.51)*	2080	1.53	0.433 *(0.263)*	16.16 *(3.18)*	171 *(77)*	58 *(14)*	29.30 *(99.22)*

TRACTOR SOUND LEVEL WITH CAB	dB(A)
Gear chosen to 4.7 mph *(7.5 km/h)* 5th gear	76.5
Maximum Sound Level—8th gear	77.0
Transport speed—no load 12th gear	76.5
Bystander	—

TIRES AND WEIGHT		Tested Without Ballast
Rear Tires	—No., size, ply & psi *(kPa)*	Four 20.8R42; **; inner 14 *(97)*; outer 12 *(83)*
Front Tires	—No., size, ply & psi *(kPa)*	Four 20.8R42; **; inner 14 *(97)*; outer 12 *(83)*
Height of Drawbar		16.5 in. *(420 mm)*
Static Weight with operator	—Rear	14400 lb *(6532 kg)*
	—Front	15900 lb *(7212 kg)*
	—Total	30300 lb *(13744 kg)*

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with official OECD, SAE and Nebraska test procedures. For the maximum power tests, the fuel temperature at the injection pump inlet was maintained at 127° F (53° C). The drawbar pull in 1st gear was limited to avoid tractor bouncing. The performance figures on this summary were taken from a test conducted under the OECD Code II restricted standard test code procedure.

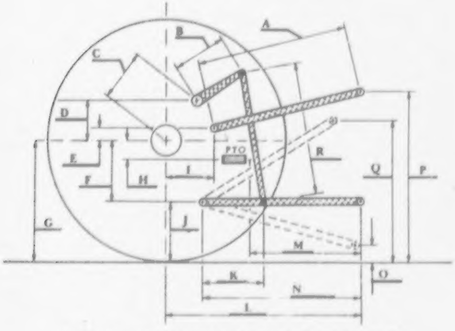
We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1652**, Summary 097, October 17, 1991.

LOUIS I. LEVITICUS
Engineer-in-Charge

K. VON BARGEN
R. D. GRISSO
L. L. BASHFORD
Board of Tractor Test Engineers

THREE POINT HITCH PERFORMANCE
(OECD Static Test)

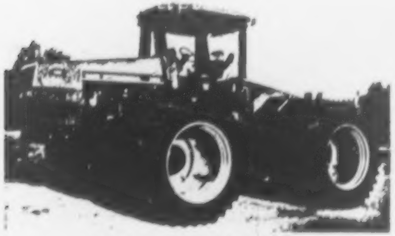
CATEGORY:	III
Quick Attach:	yes
Maximum Force Exerted Through Whole Range:	13212 lbs (58.8 kN)
i) Opening pressure of relief valve:	NA
Sustained pressure at compensator cutoff:	2470 psi (170 bar)
ii) Pump delivery rate at minimum pressure:	28.0 GPM (106.0 l/min)
iii) Pump delivery rate at maximum hydraulic power:	24.6 GPM (93.1 l/min)
Delivery pressure:	2240 psi (154 bar)
Power:	32.1 HP (24.0 kW)



	inch	mm
A	29.3	744
B	21.0	533
C	26.3	667
D	25.1	637
E	11.4	289
F	9.9	251
G	36.1	917
H	2.2	56
I	25.3	642
J	26.2	666
K	23.0	584
L	54.7	1389
L'	59.7	1516
M	25.0	635
N	42.0	1067
O	9.0	229
P	48.2	1225
Q	40.7	1034
R	37.5	953

L' to end of Quick attach

HITCH DIMENSIONS AS TESTED—NO LOAD



Case International 9280 Diesel

Agricultural Research Division
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Darrell Nelson, Dean and Director

NEBRASKA OECD TRACTOR TEST 1653—SUMMARY 098
CATERPILLAR CHALLENGER 65B DIESEL
10 SPEED

POWER TAKE-OFF PERFORMANCE

Power HP (kW)	Crank shaft speed rpm	Fuel Consumption Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Mean Atmospheric Conditions
MAXIMUM POWER AND FUEL CONSUMPTION					
Rated Engine Speed—(PTO speed—1014 rpm)					
245.20 (182.85)	2100	15.16 (57.39)	0.432 (0.263)	16.17 (3.19)	
Maximum Power (Two Hours)					
257.20 (191.79)	1953	15.34 (58.07)	0.417 (0.254)	16.77 ([illegible])	
Standard Power Take-off Speed (1000 rpm)					
250.16 (186.55)	2050	15.32 (57.99)	0.428 (0.260)	16.33 (3.22)	Air temperature
VARYING POWER AND FUEL CONSUMPTION					77°F (25°C)
245.20 (182.85)	2100	15.16 (57.39)	0.432 (0.263)	16.17 (3.19)	
215.24 (160.50)	2166	13.86 (52.47)	0.450 (0.274)	15.53 (3.06)	Relative humidity
164.34 (122.55)	2200	11.33 (42.90)	0.482 (0.293)	14.50 (2.86)	55%
111.22 (82.94)	2249	8.74 (33.08)	0.550 (0.335)	12.52 (2.47)	Barometer
56.38 (42.05)	2279	6.52 (24.68)	0.809 (0.492)	8.64 (1.70)	29.07" Hg (98.44 kPa)
0.54 (0.40)	2305	4.35 (16.47)	56.618 (34.441)	0.12 (0.02)	

Maximum Torque 822 lb.-ft (1115 Nm) @ 1300 RPM
Maximum Torque Rise 34.1%

DRAWBAR PERFORMANCE
FUEL CONSUMPTION CHARACTERISTICS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temp °F (°C) cool-ing med	Air dry bulb	Barom. inch Hg (kPa)
Maximum Power—4th Gear									
220.32 (164.29)	15775 (70.17)	5.24 (8.43)	2101	1.24	0.497 (0.302)	14.00 (2.77)	177 (80)	64 (18)	29.00 (98.16)
75% of Pull at Maximum Power—4th Gear									
172.46 (128.61)	11817 (52.56)	5.47 (8.81)	2169	0.95	0.545 (0.331)	12.84 (2.53)	177 (80)	76 (24)	29.05 (98.10)
50% of Pull at Maximum Power—4th Gear									
117.49 (87.61)	7876 (35.03)	5.59 (9.00)	2251	0.66	0.636 (0.387)	10.99 (2.17)	175 (79)	76 (24)	29.05 (98.10)
75% of Pull at Reduced Engine Speed—5th Gear									
171.70 (128.03)	11821 (52.58)	5.45 (8.77)	1897	0.95	0.499 (0.304)	14.00 (2.76)	176 (80)	76 (24)	29.05 (98.10)
50% of Pull at Reduced Engine Speed—5th Gear									
117.61 (87.70)	7888 (35.09)	5.59 (9.00)	1942	0.66	0.560 (0.340)	12.49 (2.46)	175 (79)	76 (24)	29.05 (98.10)

Location of Test: Tractor Testing Laboratory, University of Nebraska, Lincoln Nebraska 68583-0832 U.S.A.

Dates of Test: October 2-11, 1991

Manufacturer: Caterpillar Inc., 100 N.E. Adams St., Peoria, Illinois 61629

FUEL OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 55.9 **Specific gravity converted to 60°/60°F** *(15°/15°C)* 0.8395 **Fuel weight** 6.990 lbs/gal *(0.838 kg/l)* **Oil SAE** 10W30 **API service classification** CE, CD, SF **To motor** 5.964 gal *(22.575 l)* **Drained from motor** 5.836 gal *(22.091 l)* **Transmission and final drive lubricant** SAE 30W API CD/TO-2 fluid **Hydraulic lubricant** Caterpillar CXP fluid **Total time engine was operated** 21.5 hours

ENGINE: Make Caterpillar Diesel **Type** six cylinder vertical with turbocharger and intercooler **Serial No.** *08Z63806* **Crankshaft** lengthwise **Rated engine speed** 2100 **Bore and stroke** (as specified) 4.75" × 6.00" *(120.6 mm × 152.4 mm)* **Compression ratio** 15.0 to 1 **Displacement** 638 cu in *(10450 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements and aspirator **Oil filter** one full flow cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, engine coolant heat exchanger for transmission oil, radiator for steering oil, radiator for hydraulic oil **Fuel filter** one paper cartridge and screen **Muffler** underhood **Exhaust** vertical **Cooling medium temperature control** thermostat.

ENGINE OPERATING PARAMETERS: fuel rate 96.9-107.0 lb/hr *(44.0-48.6 kg/hr)* **high idle** 2220-2340 rpm **Turbo boost** nominal 14.5-19.7 psi *(100-136 kPa)* as measured 18.4 psi *(127 kPa)*

CHASSIS: Type track layer—rubber track **Serial No.** *7YC02016* **Tread width** 84.6" *(2150 mm)* **Length of track on ground** 107.0" *(2718 mm)* **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with full range operator controlled powershift **Nominal travel speeds mph (km/h)** first 2.6 *(4.2)* second 4.0 *(6.4)* third 4.7 *(7.5)* fourth 5.3 *(8.6)* fifth 6.1 *(9.9)* sixth 7.0 *(11.3)* seventh 8.1 *(13.0)* eighth 9.3 *(14.9)* ninth 12.0 *(19.3)* tenth 18.1 *(29.3)* reverse 1.9 *(3.1)*, 4.5 *(7.2)* **Clutch** multiple wet disc hydraulically power actuated by foot pedal **Brakes** caliper disc hydraulically operated by foot pedal **Steering** differential steering hydrostatically actuated by steering wheel **Power take-off** 1000 rpm at 2049 engine rpm **Unladen tractor mass** 34030 lb *(15436 kg)*

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

DRAWBAR PERFORMANCE AT 1900 RPM
MAXIMUM POWER IN SELECTED GEARS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp °F (°C) cool-ing med	Temp °F (°C) Air dry bulb	Barom. inch Hg (kPa)
				1st Gear					
190.66 (142.17)	32714 (145.52)	2.19 (3.52)	2002	14.34	0.565 (0.344)	12.36 (2.44)	176 (80)	70 (21)	28.78 (97.46)
				2nd Gear					
222.37 (165.82)	24415 (108.59)	3.42 (5.50)	1891	3.36	0.489 (0.297)	14.29 (2.82)	178 (81)	72 (22)	28.90 (97.87)
				3rd Gear					
228.72 (170.55)	20938 (93.13)	4.10 (6.59)	1897	2.08	0.474 (0.288)	14.75 (2.91)	177 (79)	65 (18)	28.97 (98.10)
				4th Gear					
229.19 (170.91)	18195 (80.93)	4.72 (7.60)	1900	1.56	0.471 (0.287)	14.83 (2.92)	177 (80)	63 (17)	28.99 (98.17)
				5th Gear					
228.20 (170.17)	15737 (70.00)	5.44 (8.75)	1900	1.24	0.468 (0.285)	14.93 (2.94)	176 (80)	58 (14)	29.00 (98.21)
				6th Gear					
224.36 (167.30)	13467 (59.90)	6.25 (10.05)	1897	1.09	0.481 (0.292)	14.54 (2.86)	179 (82)	67 (19)	28.96 (98.07)
				7th Gear					
223.43 (166.61)	11672 (51.92)	7.18 (11.55)	1901	0.98	0.485 (0.295)	14.41 (2.84)	179 (82)	69 (21)	28.94 (98.00)
				8th Gear					
219.76 (163.88)	10019 (44.56)	8.23 (13.24)	1895	0.82	0.494 (0.301)	14.15 (2.79)	179 (81)	71 (22)	28.92 (97.93)

DRAWBAR PERFORMANCE AT 2100 RPM
MAXIMUM POWER IN SELECTED GEARS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp °F (°C) cool-ing med	Temp °F (°C) Air dry bulb	Barom. inch Hg (kPa)
				1st Gear					
199.44 (148.72)	31875 (141.78)	2.35 (3.78)	2099	9.49	0.550 (0.335)	12.99 (2.56)	177 (81)	70 (21)	28.78 (97.46)
				2nd Gear					
215.85 (160.96)	21105 (93.88)	3.84 (6.17)	2098	2.24	0.508 (0.309)	13.75 (2.71)	178 (81)	72 (22)	28.88 (97.80)
				3rd Gear					
219.41 (163.61)	18046 (80.27)	4.56 (7.34)	2100	1.51	0.497 (0.302)	14.06 (2.77)	177 (81)	66 (19)	28.97 (98.10)
				4th Gear					
220.32 (164.29)	15775 (70.17)	5.24 (8.43)	2101	1.24	0.497 (0.302)	14.06 (2.77)	177 (80)	64 (18)	28.98 (98.13)
				5th Gear					
217.56 (162.23)	13551 (60.28)	6.02 (9.69)	2099	1.09	0.495 (0.301)	14.11 (2.78)	176 (80)	59 (15)	29.00 (98.21)
				6th Gear					
212.82 (158.70)	11530 (51.29)	6.92 (11.14)	2099	0.93	0.512 (0.311)	13.66 (2.69)	178 (81)	68 (20)	28.95 (98.04)
				7th Gear					
209.88 (156.51)	9914 (44.10)	7.94 (12.78)	2100	0.82	0.521 (0.317)	13.41 (2.64)	178 (81)	70 (21)	28.93 (97.97)
				8th Gear					
206.70 (154.13)	8498 (37.80)	9.12 (14.68)	2100	0.71	0.531 (0.323)	13.16 (2.59)	179 (81)	71 (22)	28.91 (97.90)

TRACTOR SOUND LEVEL WITH CAB	dB(A)
Maximum Available Power—4th Gear	75.5
75% of pull at maximum power—4th Gear	74.0
50% of pull at maximum power—4th Gear	73.5
50% of pull at reduced engine speed—5th Gear	72.0
Bystander (10th Gear)	92.0

TIRES AND WEIGHT		Tested Without Ballast
Rear Tires	—No., size, ply & psi (kPa)	NA
Front Tires	—No., size, ply & psi (kPa)	NA
Height of Drawbar		16.5 in (420 mm)
Static Weight with operator	—Rear	
	—Front	
	—Total	34195 lb (15510 kg)

REMARKS: All test results were determined from observed data obtained in accordance with official OECD, SAE and Nebraska test procedures. For the maximum power tests, the fuel temperature at the injection pump return was maintained at 165° F (73° C). The performance figures on this summary were taken from a test conducted under the OECD Code II restricted standards test code procedure.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. 1663, Summary 008, November 4, 1991.

LOUIS I. LEVITICUS
Engineer-in-Charge

K. VON BARGEN
R. D. GRISSO
L. L. BASHFORD
Board of Tractor Test Engineers

THREE POINT HITCH PERFORMANCE (SAE Static Test)

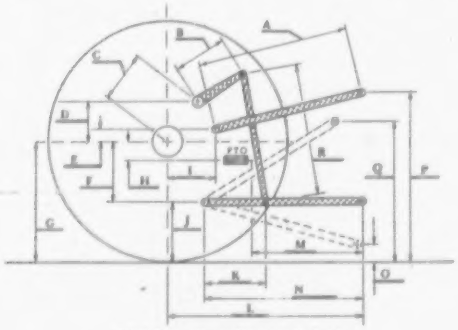
Observed Maximum Pressure psi (bar)	2500 (172)
Location	remote outlet
Hydraulic oil temperature °F(°C)	142 (61)
Location	hydraulic reservoir
Category	III
Quick attach	no

Hitch point distance to ground level in. (mm)	8.6 (218)	15.8 (401)	24.4 (620)	33.6 (853)	43.9 (1115)
Lift force on frame lb	30640	28060	23600	19350	13680
" " " " " " (kN)	(136.3)	(124.8)	(105.0)	(86.1)	(60.9)

THREE POINT HITCH PERFORMANCE
(OECD Static Test)

CATEGORY: III
Quick Attach: none

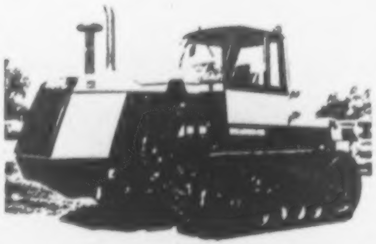
Maximum Force Exerted Through Whole Range	11367 lbs (50.6 kN)
i) Opening pressure of relief valve	NA
Sustained pressure at compensator cutoff	2490 psi (172 bar)
ii) Pump delivery rate at minimum pressure	27.1 GPM (102.6 l/min)
iii) Pump delivery rate at maximum hydraulic power	23.6 GPM (89.3 l/min)
Delivery pressure	2280 psi (157 bar)
Power	31.4 HP (23.4 kW)



Hitch Dimensions as Tested — No Load

	inch	mm
A	26.7	678
B	21.5	545
C	18.6	472
D	16.3	415
E	16.6	422
F	3.9	98
G	23.9	606
*H	−5.1	−130
I	14.6	370
J	20.0	508
K	21.1	535
L	40.6	1030
M	25.5	648
N	30.1	765
O	9.0	229
P	47.0	1194
Q	37.7	958
R	26.1	663

*PTO is above rear axle



Caterpillar Challenger 65B Diesel

Agricultural Research Division
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Darrell Nelson, Dean and Director

NEBRASKA TRACTOR TEST 1655—BELARUS 572 DIESEL ALSO BELARUS 505, 525 and 570 DIESEL
18 SPEED

POWER TAKE-OFF PERFORMANCE

Power Hp (kW)	Crank shaft speed rpm	Fuel Consumption gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temperature °F (°C) Cooling medium	Air wet bulb	Air dry bulb	Barometer inch Hg (kPa)
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed — Two hours (PTO Speed—596 rpm)								
61.24 (45.67)	1800	3.58 (13.56)	0.408 (0.248)	17.12 (3.37)	182 (83)	59 (15)	75 (24)	28.74 (97.31)
Standard Power Take-off Speed — (540 rpm)—One Hour								
59.41 (44.30)	1632	3.39 (12.83)	0.399 (0.243)	17.53 (3.45)	187 (86)	60 (16)	76 (25)	28.70 (97.19)
VARYING POWER AND FUEL CONSUMPTION — Two Hours								
54.79 (40.86)	1898	3.15 (11.94)	0.402 (0.245)	17.37 (3.42)	176 (80)	62 (17)	79 (26)	
0.32 (0.24)	1944	0.93 (3.51)	20.333 (12.368)	0.34 (0.07)	152 (66)	62 (17)	80 (26)	
27.82 (20.75)	1950	1.89 (7.16)	0.476 (0.289)	14.70 (2.90)	164 (73)	63 (17)	80 (27)	
61.69 (46.00)	1795	3.54 (13.39)	0.401 (0.244)	17.44 (3.44)	185 (85)	61 (16)	78 (26)	
14.06 (10.48)	1959	1.40 (5.31)	0.698 (0.424)	10.02 (1.97)	159 (71)	63 (17)	81 (27)	
41.47 (30.93)	1915	2.50 (9.46)	0.421 (0.256)	16.60 (3.27)	168 (76)	63 (17)	81 (27)	
Av 33.36 *Av (24.88)*	**1905**	**2.24** *(8.46)*	**0.468** *(0.285)*	**14.92** *(2.94)*	**167** *(75)*	**62** *(17)*	**80** *(27)*	**28.67** *(97.10)*

DRAWBAR PERFORMANCE
(Front Drive in Automatic Mode)

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temp °F (°C) Cool-ing med	Air wet bulb	Air dry bulb	Barom. inch Hg (kPa)
Maximum Available Power — Two Hours 11th (5H) Gear											
53.49 (39.89)	3729 (16.59)	5.38 (8.66)	1799	5.48	3.54 (13.40)	0.465 (0.283)	15.11 (2.98)	178 (81)	51 (11)	58 (14)	28.64 (96.99)
75% of Pull at Maximum Power — Ten Hours 11th (5H) Gear											
44.00 (32.81)	2866 (12.75)	5.76 (9.26)	1906	2.48	2.99 (11.33)	0.475 (0.289)	14.73 (2.90)	178 (81)	54 (12)	66 (19)	28.69 (97.15)
50% of Pull at Maximum Power — Two Hours 11th (5H) Gear											
29.64 (22.10)	1917 (8.53)	5.80 (9.33)	1909	1.96	2.30 (8.69)	0.542 (0.329)	12.91 (2.54)	171 (77)	63 (17)	76 (24)	28.58 (96.77)
50% of Pull at Reduced Engine Speed — Two Hours 16th (8H) Gear											
29.62 (22.09)	1916 (8.52)	5.80 (9.33)	1120	1.85	1.94 (7.34)	0.457 (0.278)	15.28 (3.01)	189 (87)	65 (18)	81 (27)	28.57 (96.75)

Department of Biological Systems Engineering

Dates of Test: October 16–25, 1991

Manufacturer: MINSK TRACTOR WORKS, MTZ, Minsk USSR

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 53.9 (rating taken from oil company's inspection data) **Specific gravity converted to 60/60°F** *(15/15°C)* 0.8395 **Fuel weight** 6.990 lbs/gal *(0.838 kg/l)* **Oil SAE** 10W-30 **API service classification** SG, CE **To motor** 2.836 gal *(10.737 l)* **Drained from motor** 2.711 gal *(10.264 l)* **Transmission and final drive lubricant** SAE 90 gear lubricant **Hydraulic lubricant** SAE 30 **Total time engine was operated** 41.0 hours.

ENGINE: Make MTZ **Model** D242 Diesel **Type** four cylinder vertical **Serial No.** 725298 **Crankshaft** lengthwise **Rated rpm** 1800 **Bore and stroke** (as specified) 4.331" × 4.921" *(110 mm × 125.0 mm)* **Compression ratio** 16 to 1 **Displacement** 290 cu in *(4750 ml)* **Starting system** 24 volt **Lubrication** pressure **Air cleaner** oil bath with precleaner **Oil filter** full flow centrifugal **Oil cooler** radiator for crankcase oil **Fuel filter** one paper element and one cleanable screen **Muffler** vertical **Cooling medium temperature control** one thermostat and radiator shutter

ENGINE OPERATING PARAMETERS: fuel rate: maximum 25.1 lb/h *(11.4 kg/h)* **high idle:** not to exceed 1950 rpm

CHASSIS: Type front wheel assist **Serial No.** 258820 **Tread width** rear 56.7" *(1440 mm)* to 82.7" *(2100 mm)* front 53.1" *(1350 mm)* to 70.9" *(1800 mm)* **Wheel base** 96.5" *(2450 mm)* **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center-line of rear wheels 36.1" *(917 mm)* Vertical distance above roadway 40.4" *(1025 mm)* Horizontal distance from center of rear wheel tread 0.4" *(11 mm)* to the right **Hydraulic control system** direct engine drive with throwout lever (engaged during test) **Transmission** selective gear fixed ratio **Advertised speeds mph (km/h)** first 1.0 *(1.6)* second 1.3 *(2.1)* third 1.7 *(2.7)* fourth 2.2 *(3.6)* fifth 2.9 *(4.6)* sixth 3.5 *(5.6)* seventh 3.8 *(6.1)* eighth 4.2 *(6.7)* ninth 4.7 *(7.4)* tenth 4.9 *(7.9)* eleventh 5.5 *(8.8)* twelfth 6.0 *(9.7)* thirteenth 6.5 *(10.4)* fourteenth 7.1 *(11.4)* fifteenth 7.9 *(12.8)* sixteenth 9.4 *(15.1)* seventeenth 13.2 *(21.2)* eighteenth 17.4 *(28.1)* reverse 2.1 *(3.4)*, 2.8 *(4.4)*, 3.5 *(5.7)*, 4.7 *(7.5)* **Clutch** single dry disc operated by foot pedal **Brakes** dry disc operated by two foot pedals which can be locked together **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 156" *(3.96 m)* left 191" *(4.85 m)* (on concrete surface without brake) right 175" *(4.45 m)* left 215" *(5.46 m)* **Turning space diameter** (on concrete surface with brake applied) right 323" *(8.20 m)* left 393" *(9.98 m)* (on concrete surface without brake) right 361" *(9.17 m)* left 441" *(11.20 m)* **Power take-off** 540 rpm at 1632 engine rpm **Unladen tractor mass** 8310 lb *(3770 kg)*

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

***NOTE:** Tractor is shipped with rear weights—168 lb *(76 kg)* and front weight package—492 lb *(223 kg)*.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and and Nebraska test procedures. Startup was delayed twice due to malfunction in the starter circuit. For the maximum power tests, the fuel temperature at the injection pump return was maintained at 151°F *(66°C)*. Thirteen gears were chosen between 15% slip and 10 mph *(16.1 km/h)*.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1655**, November 25, 1991.

LOUIS I. LEVITICUS
Engineer-in-Charge

K. VON BARGEN
R. D. GRISSO
L. L. BASHFORD
Board of Tractor Test Engineers

MAXIMUM POWER IN SELECTED GEARS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank-shaft speed rpm	Slip %	Gear	Cooling med °F (°C)	Air wet bulb	Air dry bulb	Barom. inch Hg (kPa)
47.75 (35.59)	9321 (41.46)	1.92 (3.09)	1807	14.66	4th (2H) Gear	169 (76)	49 (9)	54 (12)	28.65 (97.02)
53.00 (39.52)	7329 (32.60)	2.71 (4.36)	1799	5.78	5th (3L) Gear	170 (77)	49 (9)	54 (12)	28.65 (97.02)
53.94 (40.22)	5945 (26.44)	3.40 (5.48)	1803	4.73	6th (4L) Gear	191 (88)	61 (16)	72 (22)	28.58 (96.78)
54.94 (40.97)	5632 (25.05)	3.66 (5.89)	1798	4.52	7th (3H) Gear	190 (88)	59 (15)	68 (20)	28.57 (96.75)
54.32 (40.51)	5032 (22.38)	4.05 (6.51)	1798	4.02	8th (5L) Gear	188 (86)	57 (14)	64 (18)	28.57 (96.75)
54.99 (41.00)	4552 (20.25)	4.53 (7.29)	1797	3.66	9th (4H) Gear	190 (88)	59 (15)	69 (21)	28.58 (96.78)
55.01 (41.02)	4342 (19.31)	4.75 (7.65)	1798	3.66	10th (6L) Gear	179 (81)	41 (5)	49 (9)	29.26 (99.08)
55.09 (41.08)	3830 (17.04)	5.39 (8.68)	1798	3.22	11th (5H) Gear	179 (81)	38 (3)	47 (8)	29.26 (99.08)
54.65 (40.76)	3495 (15.55)	5.86 (9.44)	1794	2.93	12th (7L) Gear	184 (84)	42 (6)	51 (11)	29.25 (99.05)
54.48 (40.63)	3222 (14.33)	6.34 (10.21)	1799	2.71	13th (6H) Gear	177 (80)	40 (4)	47 (8)	29.26 (99.08)
53.79 (40.11)	2886 (12.84)	6.99 (11.25)	1798	2.56	14th (8L) Gear	182 (83)	42 (6)	52 (11)	29.25 (99.05)
53.63 (39.99)	2568 (11.42)	7.83 (12.60)	1799	2.26	15th (7H) Gear	184 (84)	58 (14)	65 (18)	28.57 (96.75)
52.03 (38.80)	2096 (9.32)	9.31 (14.98)	1801	1.88	16th (8H) Gear	182 (83)	58 (14)	66 (19)	28.57 (96.75)

LUGGING ABILITY IN 11th (5H) GEAR

Crankshaft Speed rpm	1798	1619	1435	1257	1073	902
Pull—lbs (kN)	3830 (17.04)	4201 (18.69)	4565 (20.31)	4720 (21.00)	4626 (20.58)	4448 (19.79)
Increase in Pull %	0	10	19	23	21	16
Power—Hp (kW)	55.09 (41.08)	54.20 (40.41)	52.05 (38.82)	47.10 (35.12)	39.57 (29.51)	31.92 (23.80)
Speed—Mph (km/h)	5.39 (8.68)	4.84 (7.79)	4.28 (6.88)	3.74 (6.02)	3.19 (5.14)	2.69 (4.33)
Slip %	3.22	3.37	3.95	3.95	3.95	3.66

TRACTOR SOUND LEVEL	Without cab dB(A)	With cab dB(A)
Maximum Available Power—Two Hours	91.0	83.5
75% of Pull at Maximum Power—Ten Hours	91.0	82.0
50% of Pull at Maximum Power—Two Hours	90.0	82.5
50% of Pull at Reduced Engine Speed—Two Hours	87.5	81.0
Bystander in 18th (9H) gear	82.5	86.5

DRAWBAR PERFORMANCE

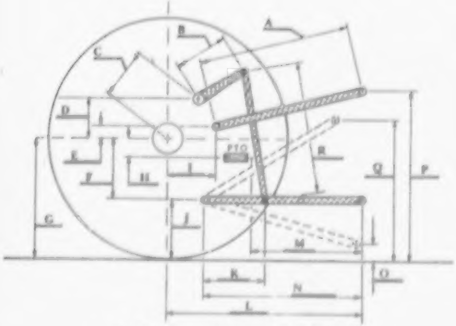
Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank-shaft speed rpm	Slip %		Temp °F (°C) Cool-ing med	Air wet bulb	Air dry bulb	Barom. inch Hg (kPa)
MAXIMUM POWER IN SELECTED GEARS									
*** MAXIMUM POWER (4WD MODE)**									
51.51 (38.41)	3781 (16.82)	5.11 (8.22)	1802	2.57	11th (5H) Gear	191 (88)	60 (16)	70 (21)	28.58 (96.78)
MAXIMUM PULL (2WD MODE)									
49.53 (36.93)	7410 (32.96)	2.51 (4.03)	1806	13.84	5th (3L) Gear	173 (78)	49 (9)	54 (12)	28.65 (97.02)

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi (kPa)	Two 15.5-38F; 8; 24 (165)	Two 15.5-38F; 8; 24 (165)
Ballast	—Liquid (each)	635 lb (288 kg)	None
	—Cast iron (each)	None	None
Front Tires	—No., size, ply & psi (kPa)	Two 11.2-20; 8; 20 (140)	Two 11.2-20; 8; 20 (140)
Ballast	—Liquid (each)	None	None
	—Cast iron (each)	5 lb (2 kg)	None
Height of Drawbar		15.0 in (381 mm)	15.0 in (381 mm)
Static Weight with Operator	—Rear	7060 lb (3202 kg)	5790 lb (2626 kg)
	—Front	3366 lb (1527 kg)	3356 lb (1522 kg)
	—Total	10426 lb (4729 kg)	9146 lb (4149 kg)

THREE POINT HITCH PERFORMANCE

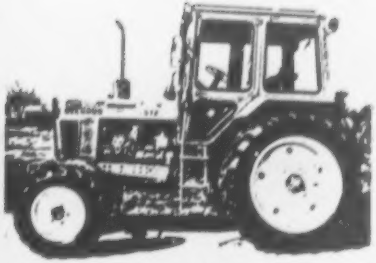
Observed Maximum Pressure psi *(kPa)*	2840	*(19570)*
Location	remote outlet	
Hydraulic oil temperature °F *(°C)*	154	*(68)*
Location	hydraulic reservoir	

	Maximum Lift Capacity	
QUICK ATTACH	No	
CATEGORY	II	
LOAD lbs *(kg)*	4366	*(1980)*
TIME sec	2.90	
HITCH POINT MOVEMENT in *(mm)*		
Lowest position	12.0	*(305)*
Top of travel range	36.0	*(914)*
Highest position	36.2	*(919)*
LOAD CG MOVEMENT in *(mm)*		
Lowest position	11.3	*(287)*
Top of travel range	42.0	*(1067)*
Highest position	42.2	*(1072)*



Hitch Dimensions as Tested — No Load

	inch	mm
A	24.1	*612*
B	10.2	*259*
C	17.6	*447*
D	10.6	*269*
E	6.3	*160*
F	9.6	*244*
G	29.3	*744*
H	4.6	*117*
I	19.0	*483*
J	19.7	*500*
K	18.0	*457*
L	42.8	*1087*
M	26.0	*660*
N	33.9	*861*
O	8.0	*203*
P	38.7	*983*
Q	35.0	*889*
R	19.5	*495*



Belarus 572 Diesel

Agricultural Research Division
Institute of Agriculture and Natural Resources
University of Nebraska-Lincoln
Darrell W. Nelson, Dean and Director

Ten-Year Summary of Test Reports, 1982-1991

					ENGINE										FUEL CONSUMPTION (HP Hours Per Gallon) at:		—Varing Drawbar Power—		
MAKE AND MODEL OF TRACTOR	Test No.	Fuel Used	Weight With Ballast	Lbs. Ballast Carried	No. of Cylinders	Bore and Stroke	Displacement Cu. in.	Rated RPM	Max. PTO HP at Rated Engine RPM	Std. PTO RPM	Max. PTO HP Std. PTO RPM	Max. Drawbar HP	MPH at Max. Dwbr. HP	Max. Lbs. Pull	Max. PTO HP at Std. PTO RPM	PTO Average at Varying Power	Max. Available Power	75% of Pull Max. Power	50% of Pull at Max. Power
Allis Chalmers																			
6070	1545	Die.	10515	3055	4	3.875x4.25	200	2300	70.78	540	71.01	59.56	7.90	7997	16.45	12.60	13.38	12.30	10.40
6140	1445	Die.	6195	1735	3	3.858x4.055	142	2500	41.08	541	38.04	33.97	5.20	4768	13.47	10.20	10.87	10.25	8.88
8010 Powershift	1446	Die.	13185	555	6	3.875x4.25	301	2300	107.38	1000	109.55	93.01	6.16	9102	15.01	11.49	12.57	11.48	9.54
8030 Powershift	1447	Die.	17100	2085	6	4.25x5.00	426	2300	133.75	1000	134.42	116.65	6.35	13348	15.25	11.78	12.93	11.87	10.00
8050 Powershift	1448	Die.	19380	4075	6	4.25x5.00	426	2300	152.40	1000	155.15	134.13	4.89	16728	15.88	12.51	13.71	12.73	10.80
8070 Powershift	1449	Die.	22370	5520	6	4.25x5.00	426	2400	170.72	1000	171.44	167.29	5.87	18777	16.48	12.81	13.67	12.59	10.64
Belarus																			
420A/400A	1638	Die.	8665	1140	4	4.134x4.724	254	1800	50.68	540	50.68	44.91	3.83	7435	16.30	13.62	14.06	13.56	11.77
570/572	1655	Die.	10426	1280	4	4.331x4.921	290	1800	61.24	540	59.41	55.09	5.39	9321	17.53	14.93	15.11	14.78	12.92
822/820	1640	Die.	11075	1765	4	4.331x4.921	290	2200	75.15	540	71.71	64.27	5.54	9973	16.99	14.27	14.53	13.98	12.29
1770	1641	Die.	20490	905	6	5.118x4.528	558	2100	167.60	1000	171.27	151.30	5.69	18440	16.81	13.55	14.58	13.25	11.68
Case																			
1594 Synchro	1546	Die.	11100	1755	6	3.939x4.500	329	2300	85.90	1000	80.83	73.54	5.29	8331	17.04	14.04	14.26	13.56	11.99
1594 Powershift	1547	Die.	11210	1745	6	3.939x4.500	329	2300	85.54	1000	81.94	70.59	5.47	8198	16.86	13.52	13.59	13.10	11.45
1896 Powershift	1548	Die.	13925	430	6	4.016x4.724	359	2100	95.92	997	95.92	86.45	4.77	12357	16.71	12.94	14.82	13.65	11.34
2094 Powershift	1525	Die.	14750	560	6	4.625x5.000	504	2100	110.50	998	110.50	100.12	6.34	11910	15.40	12.26	13.81	12.93	11.27
2096 Powershift	1549	Die.	14940	760	6	4.016x4.724	359	2100	115.67	998	115.67	101.40	6.37	12915	17.38	14.01	15.21	13.92	11.95
2294 Powershift	1526	Die.	15670	1280	6	4.625x5.000	504	2100	131.97	998	131.97	116.38	6.31	13017	14.86	11.82	13.11	12.21	10.51
2394 Powershift	1527	Die.	18595	2355	6	4.625x5.000	504	2100	162.15	1002	162.15	142.07	5.53	15497	15.46	12.70	13.42	12.71	11.04
2594 Powershift	1529	Die.	19790	3570	6	4.625x5.000	504	2100	182.07	1002	182.07	161.96	6.40	16874	15.22	12.88	13.37	12.94	11.63
3294 Powershift	1528	Die.	17980	0	6	4.625x5.000	504	2100	162.63	998	162.63	143.68	5.75	16242	15.32	12.58	13.55	12.76	11.13
4994 Powershift	1530	Die.	39930	8615	8	5.00x5.51	866	2100	344.04	991	344.04	306.43	7.20	34519	17.03	13.81	14.67	13.87	12.18
Case IH																			
685	1604	Die.	8845	3010	4	3.875x5.06	239	2400	61.02	540	58.80	54.63	5.42	7207	14.76	11.56	12.66	11.86	9.95
2394 Powershift	1582	Die.	18630	2230	6	4.625x5.00	504	2100	162.92	1002	162.92	148.98	5.12	17425	15.81	13.02	14.36	13.56	11.89
3394 Powershift	1583	Die.	18610	2810	6	4.625x5.00	504	2100	162.86	1002	162.86	144.82	5.08	17421	15.39	12.59	13.51	12.48	10.55
3594 Powershift	1584	Die.	20500	2910	6	4.625x5.00	504	2100	182.27	1002	182.27	165.12	5.07	20384	15.46	13.05	13.70	12.91	11.20
John Deere																			
750 8 Speed	1504	Die.	2150	155	3	3.15x3.35	78.2	2400	18.54	540	19.80	15.73	6.41	1661	15.06	11.61	12.48	11.53	9.83
1250	1437	Die.	5180	90	3	3.74x4.33	143	2500	40.70	540	40.98	34.01	5.39	3750	17.00	13.56	13.90	12.71	10.68
1450 9 Speed	1505	Die.	6570	1340	4	3.74x4.33	190	2400	51.39	540	50.93	43.79	7.68	5321	17.60	14.01	14.74	13.67	11.64
1650 9 Speed	1506	Die.	7785	2435	4	3.74x4.33	190	2300	62.22	540	62.70	54.06	7.79	6572	18.81	15.53	15.96	14.97	12.95
2150 16 Speed	1469	Die.	5930	820	3	4.19x4.33	179	2500	46.47	540	46.13	38.69	6.98	4875	14.77	11.15	11.88	11.24	9.47
2350 16 Speed	1470	Die.	7190	380	4	4.19x4.33	239	2500	56.18	540	55.69	47.53	6.77	5688	15.67	11.66	12.96	11.87	9.87
2550 16 Speed	1471	Die.	8485	1575	4	4.19x4.33	239	2500	65.94	540	65.53	56.24	6.22	6979	15.42	11.85	12.83	12.09	10.10
2750 16 Speed	1472	Die.	9625	2125	4	4.19x4.33	239	2500	75.35	540	75.07	63.98	4.75	7581	16.11	12.29	13.13	12.37	10.51
2755	1605	Die.	9715	1170	4	4.19x4.33	239	2300	76.57	1000	77.63	66.05	5.18	7498	17.82	14.04	14.37	14.19	12.14
2950 16 Speed	1473	Die.	11045	945	6	4.19x4.33	359	2500	85.77	1000	85.50	73.30	6.57	8768	16.33	12.21	13.58	12.45	10.53
2955	1606	Die.	11150	130	6	4.19x4.33	359	2300	86.22	1000	85.54	74.20	5.42	9971	17.41	13.63	14.82	13.79	11.64
3150 (3155)	1589	Die.	12300	355	6	4.19x4.33	359	2400	96.06	997	96.06	83.04	5.64	10507	16.45	13.09	14.23	13.34	11.21
4050 Quad	1474	Die.	13005	835	6	4.57x4.75	466	2200	101.49	1002	101.49	92.05	6.49	10331	15.12	11.72	13.44	12.54	10.64
4050 Quadrange	1590	Die.	13670	1280	6	4.19x4.33	359	2200	105.89	1003	105.89	96.35	5.86	11381	17.23	13.60	15.34	14.25	12.13
4050 Powershift	1457	Die.	13030	310	6	4.57x4.75	466	2200	100.95	1002	100.95	88.75	7.88	11058	15.08	11.59	12.60	11.69	9.65
4050 Powershift	1591	Die.	13685	1000	6	4.19x4.33	359	2200	105.69	1003	105.69	91.64	8.51	11378	17.40	13.78	14.61	13.47	10.99
4250 Quad	1475	Die.	14990	1620	6	4.57x4.75	466	2200	120.21	1002	120.21	108.77	5.71	12858	15.70	12.21	13.90	12.82	10.64
4250 Powershift	1458	Die.	14970	1115	6	4.57x4.75	466	2200	120.86	1002	120.86	105.11	8.36	12802	15.78	12.33	13.44	12.08	10.17
4450 Quad	1476	Die.	16680	2380	6	4.57x4.75	466	2200	140.33	1002	140.33	125.18	5.01	15069	16.36	13.08	14.42	13.45	11.61
4450 Quad (1)	1476	Die.	16760	2005	6	4.57x4.75	466	2200	140.33	1002	140.33	126.34	5.37	16278	16.36	13.08	14.68	—	—
4450 Powershift	1459	Die.	16745	1795	6	4.57x4.75	466	2200	140.43	1002	140.43	121.94	8.03	15014	16.15	12.94	13.63	12.58	10.60

Ten-Year Summary of Test Reports, 1982-1991

						ENGINE										FUEL CONSUMPTION (HF Hours Per Gallon) at:-				
MAKE AND MODEL OF TRACTOR	Test No.	Fuel Used	Weight With Ballast	Lbs. Ballast Carried	No. of Cyl-inders	Bore and Stroke	Dis-place-ment Cu. in.	Rated RPM	Max. PTO HP at Rated Engine RPM	Std. PTO RPM	Max. PTO HP Std. PTO RPM	Max. Draw-bar HP	MPH at Max. Dwbr. HP	Max. Lbs. Pull	Max. PTO HP at Std. PTO RPM	PTO Average at Varying Power	—Varing Drawbar Power— Max. Avail-able Power	75% of Pull Max. Power	50% of Pull at Max. Power
Steiger																			
Panther KP 1360 12 Speed	1456	Die.	39570	4090	6	5.50x6.00	855	2100	326.12	1002	326.12	291.14	6.92	36771	17.39	14.15	15.45	14.27	12.15
Panther KP 1400 12 Speed	1463	Die.	43175	6640	6	5.50x6.00	855	2100				333.18	4.82	40803			15.87	14.54	12.10
(1) SN 104-00331 and higher																			
Valmet																			
980 4x4	1599	Die.	13265	5000	4	4.01x4.72	239	2300	88.01	540	80.55	78.04	6.71	10722	18.23	13.14	14.35	13.19	11.26
148 4x4	1600	Die.	16830	5920	6	4.01x4.72	359	2300	126.89	1000	127.11	110.09	4.94	13574	16.92	13.63	14.29	13.29	11.71
Versatile																			
256 Hydrostatic	1518	Die.	10460	1310	4	4.02x4.72	239	2500	84.36	540	85.08	62.81	5.49	9134	16.45	12.67	11.82	11.07	9.52
276 Hydrostatic	1565	Die.	10510	1310	4	4.02x4.72	239	2500	100.22	540	102.14	70.91	5.61	7892	16.50	12.86	11.37	10.25	8.63
835 Series 3 12 Speed	1482	Die.	27980	3595	6	5.50x6.00	855	2100	200.30	1009	200.30	181.14	5.34	25687	15.82	11.86	14.45	12.74	10.45
836 Manual	1566	Die.	25960	1300	6	4.921x5.354	611	2100	192.54	1008	192.54	170.56	4.83	24123	17.71	13.80	15.59	14.11	11.99
836 Powershift	1567	Die.	25995	1535	6	4.921x5.354	611	2100	181.04	997	181.04	161.45	6.77	24723	16.65	12.56	14.80	13.34	11.24
856 Powershift	1568	Die.	28000	2920	6	4.921x5.354	6.1	2100	209.28	997	209.28	185.04	5.88	26479	17.24	13.22	15.35	13.59	11.40
875 Series 3 12 Speed	1483	Die.	29500	3870	6	5.50x6.00	855	2100	252.67	1008	252.67	227.48	5.65	26725	16.82	13.06	15.25	13.73	11.82
876 Manual	1569	Die.	29500	4540	6	4.921x5.354	611	2100				233.92	6.53	27703	—	—	16.85	15.68	13.65
936 Manual	1570	Die.	32385	5260	6	5.50x6.00	855	2100				260.45	6.78	29495			15.47	14.04	12.09
1150 8 Speed	1462	Die.	46500	11360	6	6.25x6.25	1150	2100				400.29	5.92	43219			15.84	14.64	12.35
White																			
2-55 16 Speed	1466	Die.	7055	860	4	4.02x3.94	199.4	2200	53.32	540	45.74	48.49	4.88	5037	14.89	12.38	13.35	13.21	11.39
2-65 16 Speed	1467	Die.	7110	790	4	4.02x4.65	235	2200	62.50	540	55.40	56.67	6.51	4827	16.19	12.91	13.94	13.20	11.29
2-75 16 Speed	1486	Die.	9625	1705	6	4.016x4.33	329	2200	75.39	1000	75.64	65.05	6.04	6487	15.86	12.02	13.01	12.21	10.48
2-88 18 Speed	1487	Die.	13615	0	6	3.875x5.00	354	2200	86.78	1007	86.78	74.67	6.51	9486	15.71	12.69	13.62	12.74	10.79
60 18 Speed	1636	Die.	8855	315	4	4.02x4.72	239	2200	61.07	540	61.61	52.39	3.88	7762	14.80	11.83	12.48	11.93	9.84
80 18 Speed	1637	Die.	11340	1990	4	4.02x4.72	239	2200	81.48	994	81.48	71.01	3.83	10091	16.83	13.37	14.04	13.15	11.09
100	1614	Die.	14485	545	6	4.02x4.72	359	2400	94.36	1000	93.48	82.57	5.97	13629	14.97	11.86	12.77	11.88	10.15
2-110 18 Speed	1468	Die.	13955	0	6	3.875x5.00	354	2200	110.52	1007	110.52	94.90	6.40	9500	16.77	13.27	14.19	13.08	10.84
120 (125)	1615	Die.	15315	850	6	4.02x4.72	359	2200	119.13	1000	121.94	104.69	6.62	14286	16.94	13.11	14.76	13.57	11.49
140 (145)	1616	Die.	15665	1000	6	4.02x4.72	359	2200	138.53	1000	140.30	125.01	6.17	15060	17.49	14.29	15.39	14.58	12.62
160 (170)	1607	Die.	18850	1560	6	4.49x5.32	504.5	2200	162.47	1000	165.97	142.74	6.24	18055	17.78	14.36	15.45	14.34	12.29
185 (190)	1608	Die.	18770	1620	6	4.49x5.32	504.5	2200	187.55	1000	192.38	167.72	6.18	18318	17.35	14.19	15.21	14.34	12.40
4-225	1558	Die.	24140	0	8	4.50x5.00	636	2600	195.65	1002	195.65	170.57	5.47	22865	15.60	12.06	13.64	12.42	10.44
4-270	1559	Die.	30650	0	6	4.75x6.00	638	2100	239.25	1000	242.30	211.70	6.60	27180	16.69	13.60	14.53	13.53	11.90
Yanmar																			
YM226D	1442	Die.	3380	1080	3	2.95x3.35	68.7	2600	19.42	540	17.87	16.14	4.78	2073	15.07	11.67	11.92	10.93	9.26
YM276D	1443	Die.	4110	1405	3	3.31x3.35	86.2	2600	23.00	540	22.82	18.93	5.78	2412	14.35	11.06	11.08	10.57	8.90
YM336D	1444	Die.	5020	1615	3	3.31x3.54	91.3	2600	26.98	540	25.63	23.00	6.28	3086	14.27	11.32	11.39	10.66	9.64
Zetor																			
5245/5211	1571	Die.	7295	385	3	4.02x4.33	164.6	2200	42.51	540	40.10	38.44	5.79	5955	16.56	13.17	14.59	13.83	12.10
6245/6211	1601	Die.	8535	885	4	3.94x4.33	211	2200	53.09	540	50.23	47.43	5.57	6332	16.06	13.04	13.84	13.34	11.50
7245/7211	1572	Die.	8565	725	4	4.02x4.33	219	2200	58.28	540	54.91	52.52	5.95	6356	16.82	13.51	14.36	13.90	12.33
7745/7711	1602	Die.	10360	2455	4	4.02x4.72	239	2200	65.74	540	62.17	57.56	6.63	7484	17.01	13.94	14.30	13.72	12.05

Ten-Year Summary of Test Reports, 1982-1991

						ENGINE									FUEL CONSUMPTION (HP Hours Per Gallon) at:				
																PTO	—Varing Drawbar Power—		
MAKE AND MODEL OF TRACTOR	Test No.	Fuel Used	Weight With Ballast	Lbs. Ballast Carried	No. of Cyl-inders	Bore and Stroke	Dis-place-ment Cu. in.	Rated RPM	Max. PTO HP at Rated Engine RPM	Std. PTO RPM	Max. PTO HP Std. PTO RPM	Max. Draw-bar HP	MPH at Max. Dwbr. HP	Max. Lbs. Pull	Max. PTO HP at Std. PTO RPM	Average at Varying Power	Max. Avail-able Power	75% of Pull Max. Power	50% of Pull at Max. Power
John Deere																			
4450 Powershift (1)	1459	Die.	16625	1225	6	4.57x4.75	466	2200	140.43	1002	140.43	122.51	8.58	16154	16.15	12.94	13.66	—	—
4650 Quad	1477	Die.	19615	1615	6	4.57x4.75	466	2200	165.70	998	165.70	145.58	6.45	16814	16.99	13.90	14.80	13.81	12.11
4650 Quad (1)	1477	Die.	19590	1150	6	4.57x4.75	466	2200	165.70	998	165.70	147.71	5.73	18931	16.99	13.90	14.93	—	—
4650 Powershift	1460	Die.	19660	1075	6	4.57x4.75	466	2200	165.52	998	165.52	143.33	8.12	16746	16.96	13.78	14.25	13.15	11.31
4650 Powershift (1)	1460	Die.	19740	695	6	4.57x4.75	466	2200	165.52	998	165.52	146.06	8.47	18794	16.96	13.78	14.44	—	—
4850 Powershift	1461	Die.	21435	2715	6	4.57x4.75	466	2200	192.99	998	192.99	171.27	8.04	18789	17.47	14.50	14.68	13.80	12.01
4850 Powershift (1)	1461	Die.	21440	2280	6	4.57x4.75	466	2200	192.99	998	192.99	172.60	4.26	20810	17.47	14.50	14.93	—	—
8450	1436	Die.	29150	0	6	4.57x4.75	466	2100	186.98	993	186.98	175.73	4.50	26567	15.69	12.91	14.45	13.53	11.63
8650	1435	Die.	30270	0	6	5.125x5.00	619	2100	238.56	993	238.56	221.80	5.55	28257	15.53	12.65	14.26	13.22	11.52
8850	1434	Die.	37700	0	8	5.51x5.00	955	2100	303.99	996	303.99	274.25	5.23	35330	15.74	12.82	14.06	13.34	11.65
(1) Supplementary test with radial ply tires.																			
Deutz Allis																			
6260	1574	Die.	8790	1530	3	4.02x4.92	187	2500	57.09	540	55.35	50.73	4.60	7270	15.47	13.20	12.95	13.46	11.63
7085	1575	Die.	13660	3580	4	4.02x4.92	249	2300	85.18	1000	84.35	75.13	7.56	10502	16.89	14.03	14.40	13.76	12.00
7120	1576	Die.	17595	5465	6	4.02x4.92	374	2300	122.06	1000	123.15	105.49	5.06	13633	17.15	13.63	14.20	12.98	11.36
9150	1633	Die.	18625	2710	6	4.016x4.921	374	2400	151.07	1000	150.22	135.28	5.14	17334	16.47	13.26	14.53	13.36	11.44
9170	1634	Die.	21480	4015	6	4.921x5.118	584	2300	173.37	1000	178.70	158.66	4.93	19027	16.71	12.49	13.99	12.74	10.72
9190	1635	Die.	19150	450	6	4.921x5.118	584	2300	193.55	1000	196.96	[illegible]		18970	16.38	11.92	13.57	12.20	10.27
Deutz Fahr																			
DX 3.50	1574	Die.	8790	1530	3	4.02x4.92	187	2500	57.09	540	55.35	50.73	4.60	7270	15.47	13.20	12.95	13.46	11.63
DX 4.70	1575	Die.	13660	3580	4	4.02x4.92	249	2300	85.18	1000	84.35	75.13	7.56	10502	16.89	14.03	14.40	13.76	12.00
DX 6.50	1576	Die.	17595	5465	6	4.02x4.92	374	2300	122.06	1000	123.15	105.49	5.06	13633	17.15	13.63	14.20	12.98	11.36
Ford																			
1510 (12x4) Manual	1500	Die.	3205	975	3	3.03x3.15	68.2	2800	19.72	540	20.45	16.99	6.92	1952	13.21	10.32	11.14	10.26	8.50
1510 (12x4) Synchro	1501	Die.	3200	915	3	3.03x3.15	68.2	2800	19.98	540	18.68	16.83	6.70	1900	13.50	10.29	10.97	10.27	8.57
1710 (12x4) Manual	1502	Die.	3510	1040	3	3.31x3.31	85.2	2700	23.88	540	22.19	21.02	7.06	2700	13.42	10.16	11.36	10.76	8.98
1710 (12x4) Synchro	1503	Die.	3530	1060	3	3.31x3.31	85.2	2700	23.79	540	22.34	21.23	5.68	2680	13.18	9.92	11.04	10.56	8.81
1910 (12x4) Manual	1507	Die.	4250	1270	3	3.346x3.937	103.9	2500	28.60	540	28.29	25.57	6.78	3340	12.94	10.32	11.14	10.86	9.17
1910 (12x4) Synchro	1508	Die.	4325	1285	3	3.346x3.937	103.9	2500	28.52	540	28.30	25.62	6.79	3449	12.48	10.36	10.99	10.78	9.09
2110 (12x4) Manual	1509	Die.	5105	1470	4	3.346x3.937	138.5	2500	34.79	540	34.91	30.80	7.01	3868	14.01	10.69	11.80	10.95	9.04
2110 (12x4) Synchro	1510	Die.	5110	1450	4	3.346x3.937	138.5	2500	35.11	540	35.56	31.11	6.99	3728	14.01	10.71	11.77	11.11	9.35
2610 (8x2)	1421	Die.	5940	1780	3	4.20x4.20	175	2000	36.69	540	35.14	31.45	5.52	4473	16.15	12.82	13.03	12.71	10.51
2810 (8x2)	1573	Die.	5935	1295	3	4.20x3.80	158	2000	32.83	540	31.82	29.14	5.88	4036	15.20	11.57	12.88	11.99	9.96
2910 (8x2)	1491	Die.	5925	1295	3	4.20x4.20	175	2000	36.62	540	35.09	30.45	5.77	4237	16.04	12.51	13.18	12.31	10.49
2910 (8x4)	1492	Die.	5955	1305	3	4.20x4.20	175	2000	36.40	540	34.75	31.03	5.68	4223	15.95	12.58	13.00	12.24	10.59
3610 (8x2)	1422	Die.	6340	2070	3	4.40x4.20	192	2000	42.26	540	40.17	36.80	5.85	4964	15.95	12.65	13.37	12.69	11.20
3610 (8x4)	1423	Die.	6340	2045	3	4.40x4.20	192	2000	42.47	540	40.01	35.57	8.55	4917	16.26	12.94	12.85	12.44	10.53
3910 (8x2)	1493	Die.	6440	1760	3	4.40x4.20	192	2000	42.62	540	40.39	37.02	5.93	4931	15.86	12.48	13.33	12.66	10.71
3910 (8x4)	1494	Die.	6435	1735	3	4.40x4.20	192	2000	42.67	540	41.16	36.22	5.85	4934	15.64	12.63	13.16	12.34	10.59
4110 (8x2)	1424	Die.	7500	2850	3	4.40x4.40	201	2200	48.33	540	42.65	41.25	4.51	5681	16.37	12.64	13.26	12.34	10.76
4110 (8x4)	1425	Die.	7500	2785	3	4.40x4.40	201	2200	49.26	540	44.06	40.59	4.92	5691	16.06	12.32	12.92	12.13	10.44
4610 (8x2)	1426	Die.	8190	3095	3	4.40x4.40	201	2200	52.52	540	46.72	44.51	5.17	6402	16.78	13.17	13.96	13.25	11.60
4610 (8x4)	1427	Die.	8230	3085	3	4.40x4.40	201	2200	52.32	540	47.30	43.26	5.62	6534	16.83	13.05	13.53	12.77	11.18
5610 (16x4)	1428	Die.	9700	2325	4	4.40x4.20	256	2100	62.54	540	60.58	54.63	5.69	7408	15.57	12.38	12.82	12.44	10.30
5610 (16x8)	1429	Die.	9545	3130	4	4.40x4.20	256	2100	62.57	540	59.99	53.70	6.57	7578	15.45	12.11	12.93	12.03	10.09
6610 (16x4)	1430	Die.	9700	2270	4	4.40x4.40	268	2100	72.13	540	68.27	61.17	5.62	7887	15.64	13.14	13.40	12.90	10.77
6610 (16x8)	1431	Die.	9700	2850	4	4.40x4.40	268	2100	72.30	540	69.20	62.64	6.49	7948	15.43	12.91	13.18	12.84	10.87
7610 (16x4)	1432	Die.	10800	2220	4	4.40x4.40	268	2100	86.95	1000	86.79	74.22	5.53	8804	15.75	12.44	13.36	12.29	10.35

Ten-Year Summary of Test Reports, 1982-1991

					ENGINE				Max. PTO HP at Rated Engine RPM		Max. PTO HP Std. PTO RPM		MPH at Max. Dwbr. HP		FUEL CONSUMPTION (HP Hours Per Gallon) at:-				
MAKE AND MODEL OF TRACTOR	Test No.	Fuel Used	Weight With Ballast	Lbs. Ballast Carried	No. of Cyl- inders	Bore and Stroke	Dis- place- ment Cu. in.	Rated RPM		Std. PTO RPM		Max. Draw- bar HP		Max. Lbs. Pull	Max. PTO HP at Std. PTO RPM	PTO Average at Varying Power	—Varing Drawbar Power— Max. Avail- able Power	75% of Pull Max. Power	50% of Pull at Max. Power
Ford																			
7710 (16x8)	1433	Die.	10800	2150	4	4.40x4.40	268	2100	86.62	1000	86.55	73.24	6.42	8638	15.87	12.60	13.67	12.26	10.35
TW-5	1514	Die.	14430	1340	6	4.40x4.40	401	2300	105.74	1000	96.83	95.27	8.52	12249	15.52	12.42	13.14	12.91	11.38
TW-15	1515	Die.	16010	2755	6	4.40x4.40	401	2200	121.40	1000	117.83	107.24	8.09	13247	16.90	12.39	13.83	12.80	10.88
TW-15 FWD (1)	1536	Die.	16680	2310	6	4.40x4.40	401	2200	121.25	1000	115.58	107.35	5.21	15939	16.95	12.39	13.96	12.65	10.68
TW-25	1516	Die.	17965	2530	6	4.40x4.40	401	2200	140.68	1000	135.70	126.73	5.25	14871	16.66	12.58	13.89	13.02	11.20
TW-35	1517	Die.	20270	4090	6	4.40x4.40	401	2200	170.30	1000	166.67	147.49	5.30	17054	17.41	13.81	14.31	13.91	12.18
TW-35 FWD (1)	1537	Die.	20270	3130	6	4.40x4.40	401	2200	171.12	1000	162.55	147.55	5.44	18823	17.58	14.09	14.42	13.71	12.04
(1) Drawbar test with front wheel assist engaged.																			
Hesston Fiat																			
466 12 Speed	1484	Die.	6670	950	3	3.94x4.33	158	2600	45.13	540	42.68	40.03	5.79	4969	16.74	12.41	13.66	12.87	10.95
45-66 DT	1579	Die.	5400	950	3	3.937x4.528	165	2500	39.49	540	37.97	31.74	4.68	4257	16.65	12.11	12.36	11.23	9.46
55-66 DT	1560	Die.	6570	1105	3	3.037x4.528	165	2500	45.78	540	44.84	38.74	5.64	4608	16.36	12.77	12.98	12.80	11.27
60-66 DT	1531	Die.	7460	1580	3	4.094x4.527	178.8	2500	51.49	540	48.51	45.51	5.53	5515	17.13	13.11	14.19	13.30	11.38
70-66 DT	1561	Die	8705	2015	4	3.937x4.528	220.5	2500	62.72	1000	62.71	54.83	5.69	8320	17.20	13.67	14.64	13.61	11.54
70-90	1562	Die.	7775	490	4	3.937x4.527	220.5	2500	62.25	1000	61.94	54.64	5.62	6238	16.52	13.28	14.04	13.46	11.82
80-90	1563	Die.	9465	2155	4	4.094x4.527	238.5	2500	70.86	1000	69.25	61.52	5.56	7323	17.43	13.96	14.76	14.09	12.28
100-90	1580	Die.	11580	1860	6	3.937x4.527	331	2500	91.52	1000	90.57	78.72	6.35	9911	16.24	12.93	13.62	12.76	10.68
666 12 Speed	1485	Die.	8715	2425	4	3.937x4.33	211	2500	62.40	540	60.33	54.31	5.51	6611	17.00	13.00	13.79	13.20	11.73
80-66 DT	1532	Die.	9400	2685	4	4.094x4.527	238.5	2500	70.43	1000	68.91	62.73	5.47	7245	17.22	14.08	14.96	14.21	12.66
1180 DT Turbo	1450	Die.	16885	1935	6	4.055x4.33	335	2550	107.48	1000	104.22	93.71	4.37	12905	16.40	12.54	14.16	12.74	10.42
130-90 DT Turbo	1564	Die	16385	660	6	4.094x4.527	358	2500	107.48	1000	106.80	91.59	4.67	14850	16.43	12.07	13.83	12.17	9.85
140-90 DT Turbo	1533	Die.	16425	375	6	4.094x4.527	358	2500	123.35	1000	122.83	105.81	5.05	12687	17.12	13.04	14.40	13.16	11.13
1580 DT Turbo	1451	Die.	19060	2460	6	4.528x5.118	494	2200	141.44	1000	136.14	124.15	5.48	15342	17.28	13.49	14.70	13.53	11.47
160-90 DT Turbo	1534	Die.	18370	1075	6	4.528x5.118	494	2200	141.71	1000	143.91	122.23	5.32	13848	17.53	13.61	14.38	13.62	11.84
160-90 Powershift	1603	Die.	18220	300	6	4.528x5.118	494	2200	142.64	1000	141.40	126.34	4.44	18256	16.69	12.96	13.92	12.93	11.10
180-90 DT Turbo	1535	Die.	19725	2430	6	4.528x5.118	494	2200	162.87	1000	158.66	140.45	6.40	14713	17.86	14.13	14.82	14.25	12.29
180-90 Turbo P.S.	1581	Die.	19570	1745	6	4.528x5.118	494	2200	162.15	1000	161.07	143.02	4.43	19734	16.77	13.07	14.03	13.30	11.06
International Harvester																			
3088 16 Speed	1551	Die.	12500	560	6	3.875x5.062	358	2400	81.35	1000	80.28	71.20	5.16	10995	16.03	11.36	12.84	11.59	9.76
3288	1438	Die.	13560	1800	6	3.875x5.062	358	2400	90.46	1000	88.33	80.72	6.11	11486	15.94	11.69	13.16	12.31	10.27
3488 Hydro	1439	Die.	13940	1060	6	4.30x5.35	466	2400	112.56	1000	107.11	83.43	6.50	12152	15.28	10.64	10.00	9.73	8.43
3688	1440	Die.	14335	1135	6	4.30x5.00	436	2400	113.72	1000	112.48	100.28	7.36	12250	15.75	11.82	13.30	12.35	10.38
5488	1441	Die.	20005	2765	6	4.30x5.35	466	2400	187.22	1005	187.22	164.82	5.27	18646	16.20	13.00	14.16	13.15	11.21
Kubota																			
L2250 4WD	1585	Die.	3130	530	3	3.23x3.23	79.3	2600	21.15	540	21.45	17.28	5.04	2103	17.18	13.38	13.46	12.36	10.67
L2550 4WD	1586	Die.	3850	1100	3	3.35x3.23	85.1	2600	23.98	541	24.24	20.23	5.22	2446	16.52	13.37	13.27	12.39	10.55
L2850 4WD	1587	Die.	4580	1615	4	3.23x3.23	105.7	2600	27.51	540	27.96	24.02	5.02	3143	16.98	13.07	13.49	12.68	10.92
L3350 4WD	1588	Die	5340	1155	4	3.35x3.23	113.6	2600	32.86	540	33.29	27.49	4.92	3434	17.13	13.52	13.32	12.78	11.08
L3750 4WD	1555	Die.	5945	1530	5	3.35x3.23	142	2500	36.96	540	36.81	30.69	4.96	3641	17.32	13.32	13.29	12.49	10.69
L4150 4WD	1556	Die.	6365	1840	5	3.35x3.23	142	2600	40.64	540	40.22	34.50	5.47	4257	17.12	13.24	13.14	12.81	11.07
M4030 DT	1594	Die	7375	2415	6	3.23x3.23	158.5	2600	44.05	540	44.08	36.91	6.02	4005	17.19	13.48	13.80	12.92	11.16
M4050 DT and M4050 8 Speed	1495	Die	7215	2275	6	3.23x3.23	158.5	2600	45.74	540	42.10	37.61	5.99	4259	15.06	11.57	11.67	11.52	9.88
M4950 DT & M4950 12 Speed	1496	Die.	8195	2395	6	3.35x3.23	170	2600	49.57	540	45.47	41.43	4.68	5292	14.70	11.21	11.49	11.15	9.26
M5030 DT	1595	Die.	8120	2985	6	3.35x3.23	170	2600	49.77	540	48.94	42.00	4.90	4592	17.28	13.58	13.72	13.34	11.67
M5950 DT & M5950 12 Speed	1497	Die.	9220	3100	3	4.29x4.53	196	2400	58.00	540	52.81	49.29	5.09	5749	17.08	13.44	13.64	13.53	11.83

Ten-Year Summary of Test Reports, 1982-1991

						ENGINE									FUEL CONSUMPTION (HP Hours Per Gallon) at:-		—Varing Drawbar Power—		
MAKE AND MODEL OF TRACTOR	Test No.	Fuel Used	Weight With Ballast	Lbs. Ballast Carried	No. of Cyl- inders	Bore and Stroke	Dis- place- ment Cu. in.	Rated RPM	Max. PTO HP at Rated Engine RPM	Std. PTO RPM	Max. PTO HP Std. PTO RPM	Max. Draw- bar HP	MPH at Max. Dwbr. HP	Max. Lbs. Pull	Max. PTO HP at Std. PTO RPM	PTO Average at Varying Power	Max. Avail- able Power	75% of Pull Max. Power	50% of Pull at Max. Power
Kubota																			
M6030 DT	1596	Die.	8970	3590	3	4.29x4.53	196	2400	57.74	540	53.57	48.11	5.54	5330	16.96	13.32	13.28	13.32	11.68
M6950 DT & M6950 12 Speed	1498	Die.	9575	2530	4	4.13x4.53	243	2400	66.44	540	63.96	56.74	5.02	6517	16.98	13.26	13.72	13.28	11.33
M7030 DT	1597	Die.	9405	3205	4	4.13x4.53	243	2400	68.87	540	64.38	58.49	5.23	5896	17.43	13.68	14.03	13.80	11.97
M7950 DT & M7950 12 Speed	1499	Die.	10305	3205	4	4.29x4.53	262	2400	75.44	540	69.32	65.24	5.26	7244	17.14	13.57	13.88	13.82	11.93
M8030 DT	1598	Die.	9970	3640	4	4.29x4.53	262	2400	76.91	540	70.47	64.37	6.97	6503	17.23	13.71	13.70	13.54	11.95
M8950 DT	1557	Die.	12270	2540	4	4.29x4.53	262	2400	85.63	1005	85.63	71.13	7.53	7974	16.21	12.91	12.96	12.37	10.36
Massey Ferguson																			
MF240 8 Speed	1519	Die.	4985	770	3	3.60x5.00	152	2000	34.77	540	31.89	29.39	5.30	3824	16.10	13.18	13.72	13.35	11.59
MF250 8 Speed	1520	Die.	5760	1175	3	3.60x5.00	152	2250	40.86	540	36.93	35.07	5.81	4297	15.80	12.38	12.92	12.50	10.72
MF254 12 Speed	1478	Die.	7275	1790	3	3.60x5.00	152	2250	43.36	540	40.71	35.14	5.82	3844	16.58	13.43	12.84	12.51	10.62
MF270 8 Speed	1521	Die.	8195	1295	4	3.875x5.00	236	2000	55.85	540	52.75	47.08	4.96	5896	16.79	12.99	13.44	13.10	11.22
MF274 12 Speed	1479	Die.	8190	2205	4	3.875x5.00	236	2200	55.39	540	54.26	46.76	6.56	4719	17.25	12.80	13.76	12.66	10.59
MF290 12 Speed	1522	Die.	9070	3130	4	3.975x5.00	248	2200	65.92	540	59.37	56.36	6.44	7654	16.58	12.75	13.24	12.76	10.98
MF294 12 Speed	1480	Die.	8645	1925	4	3.975x5.00	248	2100	67.39	540	64.94	56.28	5.77	5665	17.58	14.53	14.68	13.95	12.54
MF298 8 Speed	1523	Die.	11040	3070	4	4.50x5.00	318	2000	79.54	1000	73.66	69.74	5.14	8712	16.31	12.88	13.47	13.14	11.55
MF298 12 Speed	1524	Die.	10950	2935	4	4.50x5.00	318	2000	79.26	1000	74.25	67.85	7.73	8663	15.72	11.93	12.40	12.39	10.79
MF670 & 270 12 Speed	1538	Die.	9200	480	4	3.875x5.00	236	2000	55.62	1000	51.44	46.05	4.87	6382	16.39	12.37	12.93	12.10	10.26
MF690 12 Speed	1539	Die.	10295	2275	4	3.975x5.00	248	2200	65.68	540	62.25	54.78	4.77	7650	15.51	11.96	12.01	11.79	9.82
MF698 12 Speed	1540	Die.	12125	2185	4	4.50x5.00	318	2000	78.83	540	74.41	68.38	4.56	8707	15.91	11.91	12.55	12.24	10.59
MF699 12 Speed	1541	Die.	12935	2610	6	3.875x5.00	354	2200	85.79	540	78.00	71.71	4.69	8718	16.96	12.87	13.51	12.66	10.64
MF1020	1552	Die.	2930	700	3	2.953x3.347	68.7	2350	17.08	540	16.24	14.59	5.01	1771	12.53	10.51	10.36	10.44	9.39
MF1030	1553	Die.	3915	925	3	3.228x3.543	87	2500	23.35	540	22.80	18.66	5.70	2277	12.97	10.31	10.04	9.82	8.30
MF1040	1554	Die.	4715	915	3	3.622x3.937	121.7	2500	27.73	540	25.80	22.57	5.52	2795	12.98	10.01	10.07	9.53	7.84
MF2640 15 Speed	1481	Die.	16380	3945	6	3.875x5.00	354	2400	90.95	1000	87.60	74.83	6.58	10623	15.81	11.67	12.15	11.46	9.70
MF3505 16 Speed	1511	Die.	13195	260	6	3.875x5.00	354	2400	91.50	1000	87.47	74.79	6.54	8344	15.53	11.40	11.55	10.90	9.19
MF3525 16 Speed	1512	Die.	14645	1545	6	3.875x5.00	354	2400	108.01	1000	103.67	91.22	6.45	9322	16.67	11.65	12.65	11.53	9.31
MF3545 16 Speed	1513	Die.	17235	3935	6	3.875x5.00	354	2400	126.72	1000	122.15	105.16	6.82	10563	17.01	12.11	12.86	11.47	9.64
Steiger																			
Bearcat 1000	1592	Die.	28575	0	6	4.75x6.00	638	2100	218.00	1001	218.00	195.49	4.45	28566	16.61	13.41	14.68	13.57	11.60
Bearcat IV KM 225	1542	Die.	33830	5430	6	4.921x5.354	611	2100	—	—	—	193.11	4.18	31556	—	—	16.43	15.28	13.12
Cougar 1000	1593	Die.	31270	2820	6	4.75x6.00	638	2100	259.96	1001	259.96	230.18	6.59	30981	—	—	15.17	14.31	12.53
Cougar CR 1225	1577	Die.	29190	0	6	4.75x6.00	638	2100	208.61	999	208.61	184.83	5.16	29570	16.46	13.29	14.40	13.46	11.44
Cougar CR 1280	1578	Die.	29600	0	6	4.75x6.00	638	2100	258.15	999	258.15	231.19	5.19	28708	17.19	14.18	15.18	14.30	12.36
Cougar III ST 250(1)	1452	Die.	29965	0	6	4.75x6.00	638	2100	—	—	—	215.98	6.11	29539	—	—	15.16	14.40	12.76
Panther IV KM 325	1543	Die.	33715	3955	6	5.50x6.00	855	2100	—	—	—	285.67	6.78	32565	—	—	16.04	14.79	13.00
Panther IV CM 360	1544	Die.	33740	3815	6	5.40x6.50	893	2100	—	—	—	324.84	6.73	32328	—	—	15.96	15.15	13.29
Panther IV SM 325	1550	Die.	33930	5030	6	4.921x5.906	674	2100	—	—	—	278.09	6.78	33651	—	—	17.12	15.98	14.22
Panther CP 1325 12 Speed	1453	Die.	35870	410	6	5.40x6.50	893	2100	299.10	1002	299.10	266.97	6.95	33802	16.55	13.59	14.71	13.86	11.95
Panther CP 1360 12 Speed	1455	Die.	39120	3860	6	5.40x6.50	893	2100	334.33	1002	334.33	294.07	6.89	36123	16.75	13.78	14.60	13.81	11.85
Panther CP 1400 12 Speed	1464	Die.	43615	7165	6	5.40x6.50	893	2100	—	—	—	334.94	8.17	40272	—	—	14.92	14.12	12.07
Panther KP 1325 12 Speed	1465	Die.	35815	605	6	5.50x6.00	855	2100	301.21	1002	301.21	267.87	6.93	34267	17.38	13.97	15.58	14.15	11.84

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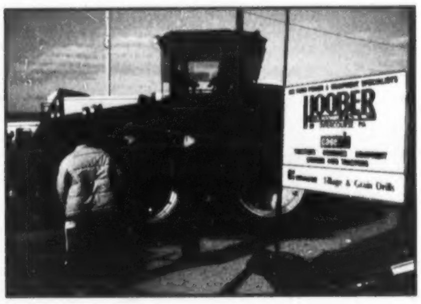
Gauging Interest At The Shows

IMPLEMENT & TRACTOR



ltural, Industrial & Outdoor Power Equipment Industry

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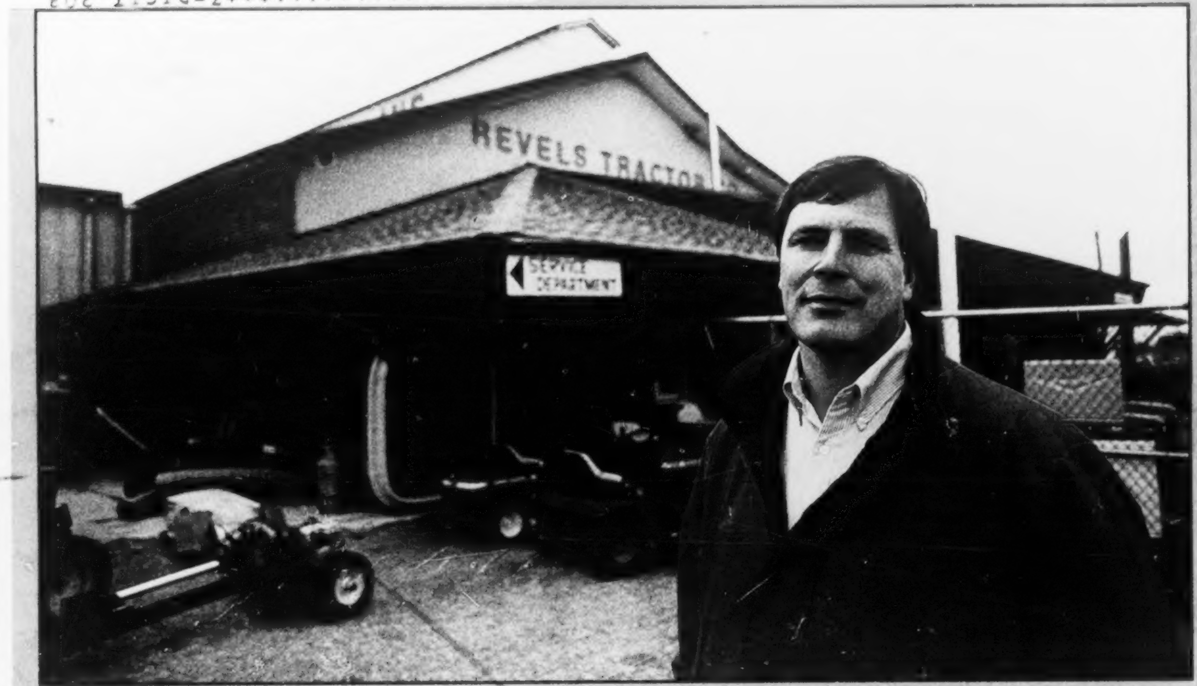

SMALL EQUIPMENT has produced lasting stability for Turner Revels Jr., general manager of the ag-turf-consumer products dealership his father started as a chainsaw shop in 1961.

Diversity
Even When It Hurts

By JIM HUDSON

SOME DEALERS believe they must specialize in farm machinery, avoiding consumer products because farmers in a hurry for parts don't want to wait in line while some "city boy" buys a lawnmower blade.

That line of reasoning doesn't hold with Turner Revels Jr., general manager of a North Carolina John Deere dealership. The conflicts that arise from handling consumer products and Deere's professional turf line alongside the agricultural machinery have been solved, or at least reduced to

(See DIVERSITY, pg. 8)

AGCO Announces Further Expansion

By SCOTT NESBITT

While the market is muddling along, AGCO is staying busy.

In recent weeks, it has opened a new tractor assembly line, given White tractor dealers a new series of water-cooled, Italian-built utility tractors, created a water-cooled White combine line based on the Gleaner, and prepared a stock prospectus to let the public buy into the action.

AGCO President and CEO Robert J. Ratliff joined other company officials in unveiling the new White tractors and combines at the old Independence, Mo., plant where Gleaner combines are built.

The factory recently underwent a $2 million renovation to add a new production line and machining facilities for production of the large (120 to 195 pto hp) White Workhorse and Deutz-Allis 9100 series tractors. AGCO took over the product line last year from White-New Idea of Coldwater, Ohio.

Ratliff said improvements to Gleaner combine manufacturing systems, particularly just-in-time inventory control, freed up enough space to add the tractor operation without expanding the 500,000-square-foot plant. The new line is designed to permit quick response to dealer orders, rather than using the old system of building a long string

(See AGCO, pg. 14)

AGCO leader Robert J. Ratliff recently participated in the unveiling of a new series of water-cooled tractors to fill the middle of the White dealer lineup.

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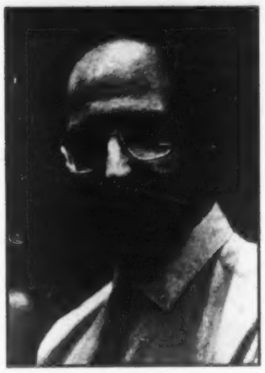
EDITOR'S NOTEBOOK

As Sales Season Heats

Maneuvering In Industry Persists



By SCOTT NESBITT

MUSINGS ON on the what and why of the farm and industrial industry as the selling season gets serious. A bit of editorial comment in italic follows some items, while others stand alone.

AGCO Finances Revealed

While AGCO has been buying and growing rapidly in the farm machinery business, the company's financial underpinnings have been kept out of the public eye, simply because it is a privately-held company.

But now AGCO joins the ranks of open-book companies, thanks to a prospectus issued in advance of the firm selling common stock, just like Deere & Co., Case-IH (through its Tenneco parent), Massey-Ferguson (through its Varity parent) and Gehl.

The AGCO prospectus, (issued March 10, with some elements still incomplete) shows the company had net sales in calendar year 1991 of $274 million, and a net income of $9.3 million. Those figures included sales and profits (or losses) on the Hesston and White Tractor product lines. The prospectus said that prior to the acquisitions of Hesston (on March 31, 1991) and White Tractor (on May 31, 1991), those two operations had net sales of $56 million, and showed a net loss of $2.3 million.

For those who like to examine price tags, the prospectus states that the Hesston was bought for about $27,825,000, of which $10,325,000 was paid from working capital and $17,500,000 from borrowed funds. The price of White Tractor was about $10,124,000, funded by a $5,000,000 cash payment in July, 1991 and a promissory note of $5,124,000, with a 12 percent interest rate, which was paid in November, 1991.

A reader can learn, for example, the distribution of AGCO in North America (79 Texas dealer contracts, 108 in Iowa, 3 in Mississippi and 8 in British Columbia). It is full of interesting facts: there are 603 dealers selling White tractors, of which 80 handle Hesston and 100 handle Deutz-Allis.

The document even lists the 1991 salaries of key AGCO executives and lays out their strategies for future growth. The financial houses handling the AGCO stock offering are The First Boston Corp. and Dillon, Read & Co., Inc. The prospectus, pending SEC approval, called for making the stock offer in April and listing it on the NASDAQ National Market System sometime this spring.

Comment: Next time someone asks "what price freedom?" show them a prospectus required by the U.S. Securities and Exchange Commission. The AGCO disclosure is almost embarrassingly complete. Revealing this much information to a competitor behind closed doors would probably be illegal. But since it's available for anyone to see, it's OK.

The prospectus is on the "must read' list of everyone in the farm machinery business, including the dealers who sell AGCO brands and their competition. If you believe in the old homilies of "know thyself" and "know thy enemy," ask your favorite stock broker to get you a copy. Then settle in for an enlightening look at an important new player in the business. □

* * * * *

Case Vibrates With Changes

The fax machines Tenneco uses to distribute news about JI Case may need to be replaced soon if the flurry of reports about the Big Red company and its parent keep up at the current pace. The new management atop Tenneco (at Houston, Texas) and Case-IH (in Racine, Wis.) was supposed to shake things up. They have.

Following is an update since the year began:

Jan. 22, 1992, Racine—JI Case restructures by dissolving the two primary business groups, Agricultural Equipment & Components and Construction Equipment & Parts. Support staffs are consolidated under the heads of North American sales and marketing, North American manufacturing and worldwide engineering.

Case chairman and CEO Robert J. Carlson says the simpler structure reduces administrative costs, streamlines the organization, improves customer service and response to market dynamics. It improves accountability and operational control.

The new management team comes mostly from outside the industry:

Edward J. Campbell, 64, came to Case early this year from Tenneco's profitable Newport News Shipbuilding and continues as president, reporting to Carlson.

Peter Menikoff, 51, came to Case last November from Tenneco's Houston base. He reports to Carlson as executive vice president for finance, audit, law, information services, real estate, corporate planning and development, and Case Credit Corp.

Richard M. Christman, 41, becomes senior vice president, sales and marketing for North America, and reports to Campbell. A Case employee since 1975, he was senior vice president over the parts division since 1989, and served in executive spots in European sales and marketing, North American ag retail enterprises, and various retail sales and marketing planning posts in both the ag and construction divisions.

Thomas E. Evans, 40, becomes senior vice president, manufacturing, for North America, and reports to Campbell. He came to Case in 1989 from Federal Mogul Corp., where he managed the seal and ball bearing operations. He also spent 14 years in engineering and manufacturing with Rockwell International.

Kenneth Q. Kessler, 60, becomes senior vice president for engineering worldwide, reporting to Campbell. He spent 34 years in Deere & Co. engineering management before joining Case in 1989, and has directed Case product development since September, 1991.

Theodore R. French, 37, becomes senior vice president and chief financial officer, reporting to Menikoff. He replaced Edward McFadden, who resigned. French spent 12 years with Rockwell International before joining Case in 1989.

Jan. 27, 1992, Racine—Case says it has reduced inventories on major products by 23 percent in 1991, bringing worldwide supplies to a level of about six months, a level Carlson called the industry norm.

The action drops inventories to a three-year low at dealers and a five-year low at the company. Counted as wholesale receivables, the cuts are valued at $750 million.

Cuts came by reducing 1991 production more than 20 percent from 1990 levels, and from "sales programs which resulted in stronger retail activity compared with industry averages."

Carlson says "both the production cuts and the sales programs came at a cost, but they were necessary to get the company on track to return

(See EDITOR'S, pg. 15)

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INDUSTRY NEWS

Sales Tick Upward Early In Year

AFTER SHOWING double-digit dips in all U.S. sales categories for 1991, the Equipment Manufacturers Institute issued reports for January and February showing an upturn in the market for tractors, except for modest losses in 2WD tractors under 40 pto hp and in 4WD tractors. Combines dropped in February after surging upward in January.

North of the border, 1991 finished in the pits, but there were signs of life in the new year, according to reports from the Canadian Farm & Industrial Equipment Institute. Through the end of February, self-propelled combine market were up 63 percent, 2WD tractors over 100 pto hp were up about 24 percent, and 4WD tractors were up 11 percent. And for those seeking real signs of vitality, there was a 219 percent gain in sales of pull-type swathers. ☐

U.S. - UNIT RETAIL SALES

	December			January-December			November 1991 Inventory
Equipment	1991	1990	% Change	1991	1990	% Change	N.A. Factory & U.S. Field
Farm Wheel Tractors:							
2-Wheel Drive							
Under 40 HP	1,874	2,215	(15.4)	35,895	42,061	(14.7)	32,078
40 & Under 100 HP	2,225	2,863	(22.3)	33,891	38,421	(11.8)	21,777
100 HP & Over	2,128	3,569	(40.4)	20,119	22,791	(11.7)	14,089
Total 2-Wheel Drive	**6,227**	**8,647**	**(28.0)**	**89,905**	**103,273**	**(12.9)**	**67,944**
Total 4-Wheel Drive	**386**	**433**	**(10.9)**	**4,069**	**5,102**	**(20.2)**	**2,482**
Total Farm Wheel Tractors	**6,613**	**9,080**	**(27.2)**	**93,974**	**108,375**	**(13.3)**	**70,426**
Combines:							
(Self-Propelled)	880	1,081	(18.6)	9,715	10,433	(6.9)	5,253

U.S. - UNIT RETAIL SALES

	January & Year-To-Date			December 1991 Inventory
Equipment	1992	1991	% Change	N.A. Factory & U.S. Field
Farm Wheel Tractors:				
2-Wheel Drive				
Under 40 HP	1,513	1,694	(10.7)	30,759
40 & Under 100 HP	2,304	1,918	20.1	21,771
100 HP & Over	1,925	1,208	59.4	13,249
Total 2-Wheel Drive	**5,742**	**4,820**	**19.1**	**65,779**
Total 4-Wheel Drive	**199**	**171**	**16.4**	**2,085**
Total Farm Wheel Tractors	**5,941**	**4,991**	**19.0**	**67,864**
Combines:				
(Self-Propelled)	593	645	8.1	4,903

U.S. - UNIT RETAIL SALES

	February			January-February			December 1991 Inventory
Equipment	1992	1991	% Change	1992	1991	% Change	N.A. Factory & U.S. Field
Farm Wheel Tractors:							
2-Wheel Drive							
Under 40 HP	1,586	1,495	6.1	3,099	3,189	(2.8)	30,759
40 & Under 100 HP	1,735	1,957	(11.3)	4,039	3,875	4.2	21,771
100 HP & Over	923	1,450	(36.3)	2,848	2,658	(7.1)	13,249
Total 2-Wheel Drive	**4,244**	**4,902**	**(13.4)**	**9,986**	**9,722**	**2.7**	**65,779**
Total 4-Wheel Drive	**161**	**193**	**(16.6)**	**360**	**364**	**(1.1)**	**2,085**
Total Farm Wheel Tractors	**4,405**	**5,095**	**(13.5)**	**10,346**	**10,086**	**2.6**	**67,864**
Combines:							
(Self-Propelled)	325	425	(23.5)	918	1,070	(14.2)	4,903

These data are, in part, estimates which are subject to revisions when final detail data become available. Because of the seasonal nature of the industry comparisons of monthly data from one period to another should be done with extreme caution. These data represent most, but not all, of the manufacturers in each product category being sold at retail in the fifty states and the District of Columbia.

*Due to the fact that the January 1992 actual numbers were not available, January Flash totals were used to compile year-to-date numbers.

Canada Report Retail Sales In Units

		December			December/Ytd	
EQUIPMENT	1991	1990	% Chg.	1991	1990	% Chg.
FARM WHEEL TRACTORS						
2WD under 40 H.P.	157	227	-30.8%	2,720	3,586	-24.1%
2WD 40-99 H.P.	621	851	-27.0%	5,864	7,227	-18.9%
2WD 100 H.P. & Over	274	318	-13.8%	2,526	2,594	-2.6%
Total 2WD	**1,052**	**1,396**	**-24.6%**	**11,110**	**13,407**	**-17.1%**
Total 4WD	**138**	**98**	**40.8%**	**1,416**	**1,586**	**-10.7%**
TOTAL FARM WHEEL TRACTORS:	**1,190**	**1,494**	**-20.3%**	**12,526**	**14,993**	**-16.5%**
COMBINES						
Self Propelled	89	84	-6.0%	1,508	1,411	6.9%
Pull Type	16	11	45.5%	128	185	-30.8%
BALERS						
Rectangular Balers	27	18	50.0%	760	1,162	-34.6%
Round Balers	99	103	-3.9%	3,259	3,731	-12.7%
SWATHERS						
Self Propelled	26	21	23.8%	719	745	-3.5%
Pull Type	23	26	-11.5%	714	1,183	-39.6%
FORAGE HARVESTERS						
Shear Bar Type	16	9	77.8%	462	522	-11.5%
MOWER CONDITIONERS	**84**	**74**	**13.5%**	**2,978**	**3,352**	**-11.2%**

Canada Report Retail Sales In Units

		January			January/Ytd	
EQUIPMENT	1992	1991	% Chg.	1992	1991	% Chg.
FARM WHEEL TRACTORS						
2WD under 40 H.P.	117	163	28.2%	117	163	28.2%
2WD 40-99 H.P.	308	360	14.4%	308	360	14.4%
2WD 100 H.P. & Over	185	126	-46.8%	185	126	-46.8%
Total 2WD	**610**	**649**	**6.0%**	**610**	**649**	**6.0%**
Total 4WD	**72**	**70**	**2.9%**	**72**	**70**	**-2.9%**
TOTAL FARM WHEEL TRACTORS:	**682**	**719**	**5.1%**	**682**	**719**	**5.1%**
COMBINES						
Self Propelled	89	42	-111.9%	89	42	-111.9%
Pull Type	3	1	-200.0%	3	1	-200.0%
BALERS						
Rectangular Balers	23	17	-35.3%	23	17	-35.3%
Round Balers	65	66	1.5%	65	66	1.5%
SWATHERS						
Self Propelled	12	10	-20.0%	12	10	-20.0%
Pull Type	25	16	-56.3%	25	16	-56.3%
FORAGE HARVESTERS						
Shear Bar Type	16	17	5.9%	16	17	5.9%
MOWER CONDITIONERS	**84**	**71**	**-18.3%**	**84**	**71**	**-18.3%**

Canada Report Retail Sales In Units

		February			February/Ytd	
EQUIPMENT	1992	1991	% Chg.	1992	1991	% Chg.
FARM WHEEL TRACTORS						
2WD under 40 H.P.	98	69	42.0%	215	232	-7.3%
2WD 40-99 H.P.	194	252	23.0%	502	612	-18.0%
2WD 100 H.P. & Over	100	104	-3.8%	285	230	23.9%
Total 2WD	**392**	**425**	**7.8%**	**1,002**	**1,074**	**-6.7%**
Total 4WD	**48**	**38**	**26.3%**	**120**	**108**	**11.1%**
TOTAL FARM WHEEL TRACTORS:	**440**	**463**	**-5.0%**	**1,122**	**1,182**	**-5.1%**
COMBINES						
Self Propelled	30	31	-3.2%	119	73	63.0%
Pull Type	1	3	-66.7%	4	4	0.0%
BALERS						
Rectangular Balers	19	30	-36.7%	42	47	-10.6%
Round Balers	63	67	-6.0%	128	133	-3.8%
SWATHERS						
Self Propelled	6	2	200.0%	18	12	50.0%
Pull Type	42	5	740.0%	67	21	219.0%
FORAGE HARVESTERS						
Shear Bar Type	14	22	-36.4%	30	39	-23.1%
MOWER CONDITIONERS	**79**	**75**	**5.3%**	**163**	**146**	**11.6%**

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MEETINGS...CONVENTIONS...SHOWS

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JUNE/JULY 1992

Briefs:

Cooper President of White-New Idea

Rodney Cooper has been appointed president of White-New Idea. The announcement was made May 20 by Bobby Middlebrooks, senior vice president of Allied Products Corporation. Allied is the parent company of White-New Idea.

COOPER

A graduate of Ohio University in Athens, Ohio, Cooper started his career with White-New Idea in 1974 as a territory manager. His experience with the company includes several sales management positions, including region manager. Cooper served as director of parts operations in Coldwater, Ohio, as well as his most recent position as vice president of sales and marketing.

Cooper replaces Charles Lunger, who has been interim president of White-New Idea since August, 1991. Lunger is returning to Allied's offices in Chicago to resume his full time responsibilities as chief operating officer. ☐

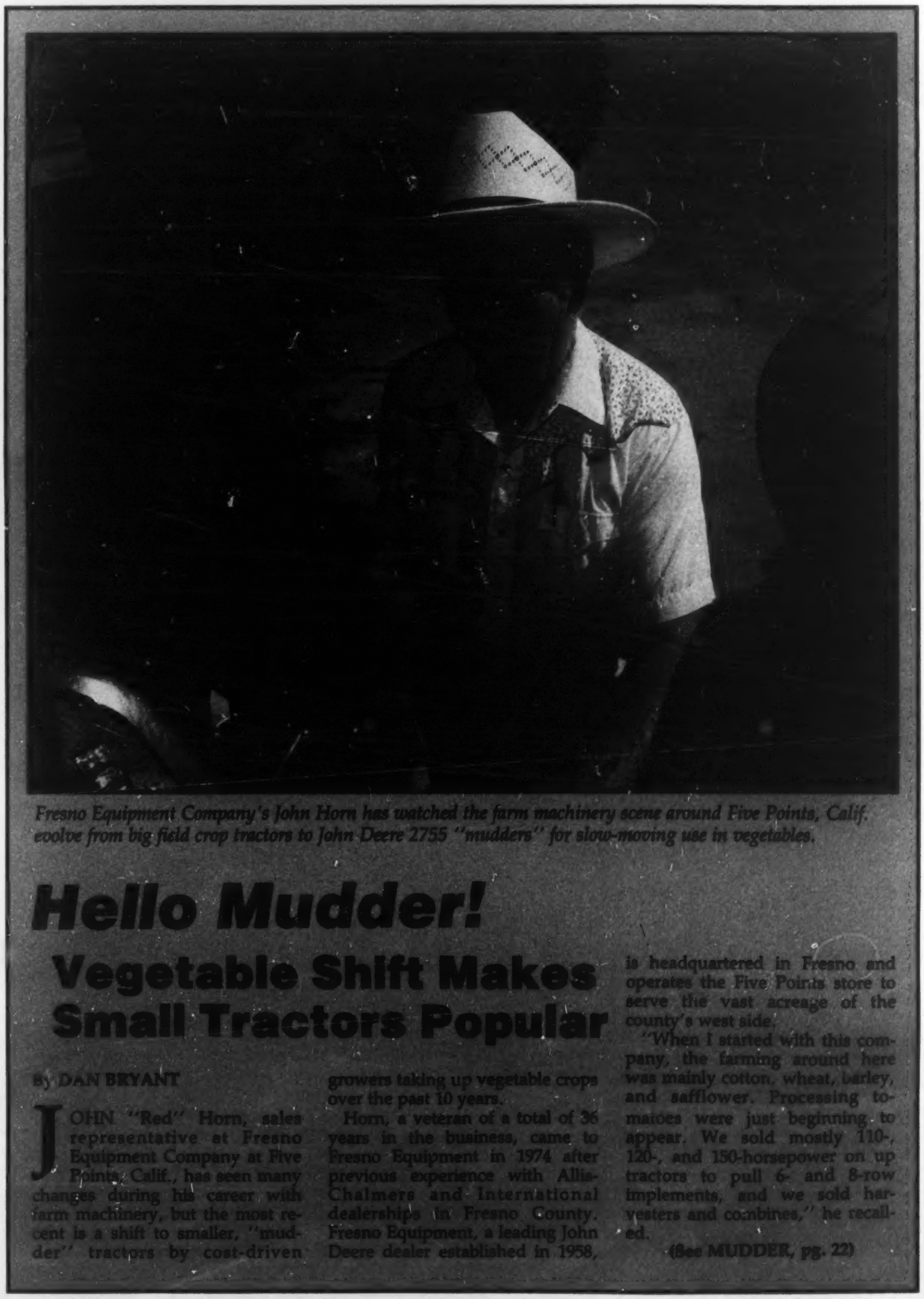
Belarus Machinery Has Strong First Quarter

While many large farm equipment manufacturers battle against a struggling farm economy and nationwide decline in orders for capital goods, Russian-owned Belarus Machinery Inc. (BMI) achieved a first-quarter sales growth of 210 percent over the same period last year.

BMI's sales outperformed the farm equipment industry as a whole, which showed a sales increase of 4.3 percent in the same period. The company's continued growth counters an industrywide trend that showed a near 14 percent drop in farm equipment sales during 1991.

According to Pavel Zakharov, BMI's vice president of finance, BMI closed 1991 with record sales of nearly 4,000 new tractors in the United States last year, representing sales of $31 million and a growth of 20 percent over 1990.

(See BRIEFS, pg. 3)



Fresno Equipment Company's John Horn has watched the farm machinery scene around Five Points, Calif. evolve from big field crop tractors to John Deere 2755 "mudders" for slow-moving use in vegetables.

Hello Mudder!

Vegetable Shift Makes Small Tractors Popular

By DAN BRYANT

JOHN "Red" Horn, sales representative at Fresno Equipment Company at Five Points, Calif., has seen many changes during his career with farm machinery, but the most recent is a shift to smaller, "mudder" tractors by cost-driven growers taking up vegetable crops over the past 10 years.

Horn, a veteran of a total of 36 years in the business, came to Fresno Equipment in 1974 after previous experience with Allis-Chalmers and International dealerships in Fresno County. Fresno Equipment, a leading John Deere dealer established in 1958, is headquartered in Fresno and operates the Five Points store to serve the vast acreage of the county's west side.

"When I started with this company, the farming around here was mainly cotton, wheat, barley, and safflower. Processing tomatoes were just beginning to appear. We sold mostly 110-, 120-, and 150-horsepower on up tractors to pull 6- and 8-row implements, and we sold harvesters and combines," he recalled.

(See MUDDER, pg. 22)

BRIEFS

(From pg. 1)

Zakharov says BMI tractor sales have increased an average of 52 percent per year from 1986 through 1991. While the company has generated about $140 million in total U.S. sales since entering the market in 1976, more than $92 million came in the last four years, representing about 375 percent growth in that period. ☐

SWEEPSTER Buys FNH Leaf Loader Line

SWEEPSTER, Inc. has reached agreement with Ford New Holland, Inc. to purchase Ford's Model 710 Leaf Loader product line. Calling it a ''strategic growth acquisition,'' SWEEPSTER vice president Jim Barden said the move ''solidifies our place in the fast growing waste recycling industry.'' The agreement calls for a purchase of all machines and parts inventory along with all tooling, patents and documentation. Financial details of the agreement were not released.

The Model 710 Leaf Loader is a diesel-powered machine towed by a dump truck. A beater and brush in combination lift the leaves off the street and feed them to a thrower. The leaves are then blown into the truck. ☐

Associations To Form Mid-America Equipment Retailers Association

The Indiana Implement Dealers Association and Kentucky Farm and Power Equipment Dealers Association will merge, effective July 1, 1992 to form the Mid-America Equipment Retailers Association serving the outdoor power, farm, industrial and construction equipment retailers in Indiana and Kentucky.

Headed by Executive Vice President David C. Lucy, Mid-America Equipment Retailers Association will represent over 600 members in the two state area. ☐

Kubota Tractor Corporation Recognizes Top Dealers

Kubota Tractor Corporation (KTC) announced its top dealers in retail tractor sales for 1991 at an annual awards trip to Nassau, Bahamas. The top dealerships receiving the prestigious award are part of KTC's 1,000-member national dealer network.

The top ten Kubota dealerships for 1991 include: Middlefield Farm & Garden, Middlefield, Ohio; Moen Machinery Co., Gresham, Ore.; Rogers Auto Parts Inc., Piedmont, S.C.; Sun Tractor Inc., Ocala, Fla.; Sound Tractor Co., Everett, Wash.; Mt. Airy Tractor Co. Inc., Mount Airy, N.C.; Daniel Implement Co. Inc., Frisco, Texas; Zimmerer Kubota & Equipment Inc., Dallas, Texas; Ginop Sales Inc., Alanson and Williamsburg, Mich.; and N.J. Richardson & Sons Inc., Woodbine, Md. ☐

U.S. - UNIT RETAIL SALES

	March			January-March			February 1992 Inventory
Equipment	**1992**	**1991**	**% Change**	**1992**	**1991**	**% Change**	**N.A. Factory & U.S. Field**
Farm Wheel Tractors:							
2-Wheel Drive							
Under 40 HP	3,358	2,884	16.4	6,477	6,073	(6.7)	31,635
40 & Under 100 HP	3,208	3,320	(3.4)	7,240	7,195	0.6	22,007
100 HP & Over	2,055	2,972	(30.9)	4,901	5,630	(12.9)	12,989
Total 2-Wheel Drive	**8,621**	**9,176**	**(6.0)**	**18,618**	**18,898**	**(1.5)**	**66,631**
Total 4-Wheel Drive	**340**	**412**	**(17.5)**	**700**	**776**	**(9.8)**	**2,178**
Total Farm Wheel Tractors	**8,961**	**9,588**	**(6.5)**	**19,318**	**19,674**	**1.8**	**68,809**
Combines:							
(Self-Propelled)	467	584	(16.6)	1,401	1,654	(15.3)	5,395

These data are, in part, estimates which are subject to revisions when final detail data become available. Because of the seasonal nature of the industry comparisons of monthly data from one period to another should be done with extreme caution. These data represent most, but not all, of the manufacturers in each product category being sold at retail in the fifty states and the District of Columbia.

U.S. - UNIT RETAIL SALES

	April			January-April			March 1992 Inventory
Equipment	**1992**	**1991**	**% Change**	**1992**	**1991**	**% Change**	**N.A. Factory & U.S. Field**
Farm Wheel Tractors:							
2-Wheel Drive							
Under 40 HP	3,979	4,457	(10.7)	10,366	10,530	(1.6)	31,029
40 & Under 100 HP	3,388	3,473	(2.4)	10,597	10,668	(0.7)	21,987
100 HP & Over	1,357	2,311	(41.3)	6,256	7,941	(21.2)	12,995
Total 2-Wheel Drive	**8,724**	**10,241**	**(14.8)**	**27,219**	**29,139**	**(6.6)**	**66,011**
Total 4-Wheel Drive	**285**	**534**	**(46.6)**	**984**	**1,310**	**(24.9)**	**2,349**
Total Farm Wheel Tractors	**9,009**	**10,775**	**(16.4)**	**28,203**	**30,449**	**(7.4)**	**68,360**
Combines:							
(Self-Propelled)	308	644	(52.2)	1,709	2,298	(25.6)	5,681

U.S. - UNIT RETAIL SALES

	May			January-May			April 1992 Inventory
Equipment	**1992**	**1991**	**% Change**	**1992**	**1991**	**% Change**	**N.A. Factory & U.S. Field**
Farm Wheel Tractors:							
2-Wheel Drive							
Under 40 HP	4,092	5,037	(18.8)	14,465	15,567	(7.1)	30,147
40 & Under 100 HP	3,027	4,152	(27.1)	13,730	14,820	(7.4)	22,875
100 HP & Over	868	1,963	(56.2)	7,136	9,924	(28.1)	13,523
Total 2-Wheel Drive	**7,987**	**11,172**	**(28.5)**	**35,331**	**40,311**	**(12.4)**	**66,545**
Total 4-Wheel Drive	**194**	**466**	**(58.4)**	**1,178**	**1,176**	**(33.7)**	**2,141**
Total Farm Wheel Tractors	**8,181**	**11,638**	**(29.7)**	**36,509**	**42,087**	**(13.3)**	**68,686**
Combines:							
(Self-Propelled)	205	1,308	(84.3)	1,920	3,606	(46.8)	5,924

Canada Report
Retail Sales In Units

		April			April/Ytd	
EQUIPMENT	**1992**	**1991**	**% Chg.**	**1992**	**1991**	**% Chg.**
FARM WHEEL TRACTORS:						
2WD under 40 H.P.	280	272	2.9%	663	637	4.1%
2WD 40-99 H.P.	516	689	-25.1%	1,552	1,669	-7.0%
2WD 100 H.P. & Over	229	241	-5.0%	824	685	20.3%
Total 2WD	**1,025**	**1,202**	**-14.7%**	**3,039**	**2,991**	**1.6%**
Total 4WD	**128**	**169**	**-24.3%**	**393**	**371**	**5.9%**
TOTAL FARM WHEEL TRACTORS:	**1,153**	**1,371**	**-15.9%**	**3,432**	**3,362**	**2.1%**
COMBINES:						
Self Propelled	34	45	-24.4%	231	156	48.1%
BALERS:						
Rectangular Balers	37	30	23.3%	111	108	2.8%
Round Balers	170	136	25.0%	432	371	16.4%
SWATHERS:						
Self Propelled	12	16	-25.0%	54	36	50.0%
Pull Type	43	10	330.0%	260	36	622.2%
FORAGE HARVESTERS:						
Shear Bar Type	33	40	-17.5%	101	95	6.3%
MOWER CONDITIONERS:	**110**	**149**	**-26.2%**	**388**	**387**	**0.3%**

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New directions in marketing

MPLEMENT
RACTOR

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VOLUME 107, NO. 5 PRICE $ 2.50 AUGUST/SEPTEMBER 1992

Product, service and not price top dealer approach

By JIM HUDSON

Don't try price shopping at Elliott Implement Co. Inc. in Whiteville, N. C. That's not the way owner and primary salesman Dick Johnson does business.

"Dealers have taught people to call up and ask for the price," says the Massey Ferguson and New Holland dealer. "Some may not know their equipment well enough so they can sell anything other than price. That's not the way we do business here. I resist telling anyone the price until I show them the features and benefits and the value of the equipment to them. How can they know what it's worth to them until they see what it can do?

"I fully believe the reason most dealers are not profitable is they refuse to sell product and service and try to sell price. I wish more dealers would get smart enough to learn it's up to us to decide whether or not we are going to make a profit."

Johnson has developed his ideas on selling farm equipment through more than a decade as a farm equipment dealer, following a successful career with Massey Ferguson. He held several positions with Massey Ferguson which put him in touch with dealers all over North America, ending his industry career as director of sales for the eastern half of North America. He became an individual dealer as a partner in Elliott Implement more than a decade ago. At the death of the original owner he bought out the remainder of Elliott Implement and Kenansville Tractor Company. His two sons, Ron and Richard Jr., have joined him in the dealerships.

"I have my own definite ideas about farm machinery salesmen," Johnson says. "The No. 1 thing I see is that salesmen do not know the features and benefits of the products they are trying to sell. They haven't taken the time to learn the machines.

(See DEALER, Page 6)

MF
475
DEEP DIG

ONE ON ONE time with a customer, explaining the benefits of the equipment he has to offer, helps Dick Johnson, right, sell farm and industrial equipment even during tough economic times.

Power Equipment Expo huge success

By SCOTT MCCLURE

It's appropriate that the International Lawn, Garden and Power Equipment Expo share the same home as the Kentucky Derby.

Like race horses pounding around a muddy Churchill Downs track, equipment manufacturers come to Louisville every year to vie for front-runnier status, setting the pace with new product introductions and customer incentive programs.

Many hope to obtain an advantage by showcasing their emphasis on trends impacting the industry. And the 1992 version of EXPO was no exception, with hot topics like environmental sensitivity and economic efficiency dominating talk at the indoor booths, and mulching mowers and chipper/shredders taking center stage in the outdoor exhibition area.

At the same time, the needs of the commercial outdoor power equipment user remained a mainstay of EXPO 92, with new, higher hp units offering operator comfort, improved performance, reduced noise levels and lower emissions. .

Overall almost 25,000 persons registered for this year's International Lawn, Garden and Power Equipment Expo, with 556 companies exhibiting products. EXPO, sponsored by the Outdoor Power Equipment Institute , was recently named as the second largest trade show in the United States.

Among the companies making introductions at EXPO 92 were:

(See MANUFACTURERS, Page 8)

Property control checklist—

(Continued from Page 3)

ments vary with the size and nature of each individual enterprise. Basically there are some things that should be considered if you decide to install a program for your firm.

Property control checklist:

Step 1—Decide what is desired from your property records and what functions are to be served.

A: Physical control:

Identification, location, custody, maintenance and repairs.

B. Tax accounting:

Original cost data, depreciation method used, determination of reserve ratios.

C. Management accounting:

Verify asset values, accounting allocations for cost accounting or tax preparation.

D. Fire and theft insurance:

Replacement Cost (new), adjusted replacement cost (actual cash value) segregations of exclusions from coverage, evidence of value for filing of claims.

E. Plan for capital expenditures (near & long term):

Tax considerations for depreciation, general considerations (moving, etc.), equipment leasing.

Step 2 —List all of the desirable property facts for each item or asset.

A. Equipment numbers (simple, easy system).

B. Description of assets.

C. Location.

D. Date of purchase.

E. Initial cost plus installation costs.

F. Depreciation reserve.

G. Unrecovered cost.

H. Estimated remaining life.

I. Investment credit (carryover-unused).

J. Depreciation method.

K. Depreciation provision.

L. Classify by asset category.

Step 3—Plan method of collecting property facts. Generally this boils down to deciding whether to use company personnel on regular working hours, on overtime, or bringing in outside help.

Step 4 — Decide best method of compiling data for implementation of program, and choose uniform recording forms.

Stock forms are available from commercial stationers, but a special form tailored to your needs can have certain advantages.

A simple card file may be adequate for a small or medium size organization. Larger groups, or those with good data processing ability, may find a computer database works best. All electronic records should be backed up with written records and floppy disks to avoid loss of data through accidental erasure.

Large or small, simplicity should be the rule. Record only essential information. Make it complicated and you'll most likely get break-downs in the system.

Use a separate form for each asset, individual or group. Make as many duplicates as deemed necessary. The original should be maintained in the controlling office, filed in straight numerical sequence according to tag number. Duplicates should be kept in a safe place outside the business location, so they won't be destroyed in a fire or flood.

Duplicates can be kept in the departments or branches of large firms, in safe-deposit box or at accountant's office for smaller firms.

Having a number assigned to an item for its life provides the necessary link between (1) the asset and (2) property records. Success depends on the adoption and maintenance of a good code numbering system. Note that manufacturers' serial numbers are not practical as item control numbers because they lack order or uniformity. They are frequently inaccessible, and some equipment may not have such a number.

Several coding systems are in common use in business and industry.

Regardless of the type of equipment or its location, the best (and least confusing) numbering system is a sequence of consecutive serial numbers. Sequence systems can code an unlimited number of items with the fewest possible digits. The purpose of a property control tag is to assign a control number to the asset. This is the necessary and important link in a profitable PCP. The tag is the critical link between the item and the record form.

Tags should be systematically mounted. It is desirable to establish standard practices for uniform mounting locations on similar types of equipment.

Several types of property control tags are available. In buying tags, the following factors should be considered:

— They should be permanent, and difficult or impossible to remove, to deter theft and accidental loss.

— Indented numbers are a good choice for machines. They are difficult to deface or alter, and can't be painted out. When stamped deeply into metal, they leave behind a "ghost image" that can still be detected with special equipment.

> *"The best numbering system is a sequence of consecutive serial numbers."*

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Canada Report
Retail Sales In Units

EQUIPMENT	1992	1991	May % Chg.	1992	1991	May/Ytd. % Chg.
Farn Wheel Tractors:						
2WD under 40 H.P.	329	390	-15.6%	993	1,027	-3.3%
2WD 40-99 H.P.	547	626	-12.6%	2,108	2,295	-8.1%
2WD 100 H.P. & Over	241	379	-36.4%	1,065	1,064	0.1%
Total 2WD	**1,117**	**1,395**	**-19.9%**	**4,166**	**4,386**	**-5.0%**
Total 4WD	**149**	**299**	**-50.2%**	**542**	**670**	**-19.1%**
Total Farm Wheel Tractors:	**1,266**	**1,694**	**-25.3%**	**4,708**	**5,056**	**-6.9%**
Combines:						
Self Propelled	55	171	-67.8%	286	327	-12.5%
Balers:						
Rectangular Balers	52	56	-7.1%	162	164	-1.2%
Round Balers	137	203	-32.5%	577	574	0.5%
Swathers:						
Self Propelled	20	38	-47.4%	78	74	5.4%
Pull Type	20	17	17.6%	280	53	428.3%
Forage Harvesters:						
Shear Bar Type	23	36	-36.1%	124	131	-5.3%
Mower Conditioners:	**110**	**184**	**-0.5%**	**573**	**571**	**0.4%**

U.S. - UNIT RETAIL SALES

	June			January-June			May 1992 Inventory
Equipment	1992	1991	% Change	1992	1991	% Change	N.A. Factory & U.S. Field
Farm Wheel Tractors:							
2-Wheel Drive							
Under 40 HP	4,264	4,988	(14.5)	18,758	20,555	(8.7)	28,265
40 & Under 100 HP	3,763	4,161	(9.6)	17,507	18,981	(7.8)	22,612
100 HP & Over	1,000	1,916	(47.8)	8,133	11,840	(31.3)	14,035
Total 2-Wheel Drive	**9,027**	**11,065**	**(18.4)**	**44,398**	**51,376**	**(13.6)**	**64,912**
Total 4-Wheel Drive	**194**	**402**	**(51.7)**	**1,372**	**2,178**	**(37.0)**	**2,196**
Total Farm Wheel Tractors	**9,221**	**11,467**	**(19.6)**	**45,770**	**53,554**	**(14.5)**	**67,108**
Combines (Self-Propelled)	508	1,165	(56.4)	2,426	4,771	(49.2)	6,307

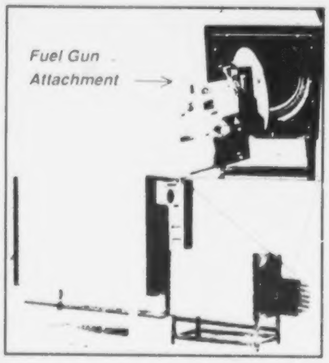
U.S. - UNIT RETAIL SALES

	July			January-July			June 1992 Inventory
Equipment	1992	1991	% Change	1992	1991	% Change	N.A. Factory & U.S. Field
Farm Wheel Tractors:							
2-Wheel Drive							
Under 40 HP	2,960	3,911	(24.3)	21,784	24,466	(11.0)	-
40 & Under 100 HP	3,271	3,093	5.8	20,792	22,074	(5.8)	-
100 HP & Over	728	943	(22.8)	8,856	12,783	(30.7)	-
Total 2-Wheel Drive	**6,959**	**7,947**	**(12.4)**	**51,432**	**59,323**	**(13.3)**	-
Total 4-Wheel Drive	**132**	**209**	**(36.8)**	**1,504**	**2,387**	**(37.0)**	-
Total Farm Wheel Tractors	**7,091**	**9,156**	**(13.2)**	**52,936**	**61,710**	**(14.2)**	-
Combines (Self-Propelled)	529	538	(1.7)	2,955	5,309	(44.3)	-

T TAYLOR

WASTE OIL WATERSTOVES®

"A Waste Oil Furnace that you can depend on and it sits outside"



- BURN THAT WASTE OIL
- SAFE TO OPERATE
- EASY TO OPERATE
- EASY TO SERVICE
  - Gun swings out for easy maintenance
  - Just add compressed air, 110 volts and connect your waste oil supply and watch your savings begin
- TOTALLY AUTOMATIC
- THERMOSTATICALLY CONTROLLED
- UNIT SITS OUTSIDE
- DELIVERS HOT WATER TO YOUR HEAT EXCHANGER FOR FREE HEAT
- ELIMINATE YOUR WASTE OIL DISPOSAL COST
- SIMPLE OPERATION WITH NEW UNIQUE FEATURES
- EFFICIENT OPERATION
- USES THROW AWAY FILTER TO AVOID NOZZLE PLUG
- HEAT CAPACITY ADJUSTS FROM 60,000 BTU TO 220,000 BTU PER HOUR
- EPA APPROVED METHOD FOR WASTE OIL DISPOSAL (40CFR266)

Gun attaches to Fuel adapter and Fuel adapter attaches to the oil flange on the TAYLOR WATERSTOVE®

IF YOU GENERATE WASTE OIL YOU NEED A TAYLOR WASTE OIL WATERSTOVE.®

CONVERT YOUR WASTE OIL INTO SAVINGS AND BURN WOOD AS A BACK UP.

THE BURNER IS DESIGNED TO BURN WASTE CRANKCASE AND LUBE OILS, AUTOMATIC TRANSMISSION OIL, #1 & #2 HEATING OILS, HYDRAULIC OILS, FUEL OILS AND KEROSENE.

T

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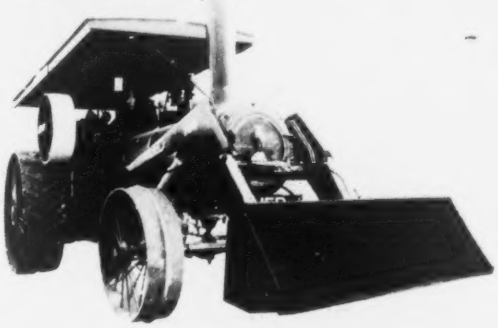
It Fits



Just about any make or model of tractor can be matched to a better value Allied Loader. If your customer doesn't want others to notice how much he's saved by purchasing an Allied Loader, we are pleased to provide factory matched custom paint. Do your customers and your dealership a favour; get the details on Allied quality and value today.

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Winnipeg, Manitoba R2C 3B2
Ph. 204-661-8711
Fax 204-654-2503

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Canada Report
Retail Sales In Units

EQUIPMENT	June 1992	June 1991	% Chg.	June/Ytd. 1992	June/Ytd. 1991	% Chg.
Farn Wheel Tractors:						
2WD under 40 H.P.	296	390	-24.1%	1,294	1,417	-8.7%
2WD 40-99 H.P.	663	666	-0.5%	2,780	2,961	-6.1%
2WD 100 H.P. & Over	254	325	-21.8%	1,302	1,389	-6.3%
Total 2WD	**1,213**	**1,381**	**-12.2%**	**5,376**	**5,767**	**-6.8%**
Total 4WD	**116**	**174**	**-33.3%**	**657**	**844**	**-22.2%**
Total Farm Wheel Tractors:	**1,329**	**1,555**	**-14.5%**	**6,033**	**6,611**	**-8.7%**
Combines:						
Self Propelled	90	161	-44.1%	376	488	-23.0%
Balers:						
Rectangular Balers	180	188	-4.3%	343	352	-2.6%
Round Balers	575	638	-9.9%	1,158	1,212	-4.5%
Swathers:						
Self Propelled	98	61	60.7%	176	135	30.4%
Pull Type	136	39	248.7%	416	92	352.2%
Forage Harvesters:						
Shear Bar Type	91	87	4.6%	215	218	-1.4%
Mower Conditioners:	**720**	**763**	**-5.6%**	**1,294**	**1,334**	**-3.0%**

Reliance offers kits

Reliance Parts Corp. now offers a complete assortment of overhaul kits for John Deere 300, 400 and 500 series diesel engines.

Available as both "in-frame" and "major" versions for all applications, Reliance overhaul kits are complete kits, including parts not normally provided by other suppliers. In-frame overhaul kits, for servicing the engine without removing it from the vehicle, contain oil pan gaskets and connecting rod capscrews in addition to cylinder kits and other standard replacement parts. Major overhaul kits, (where the engine is removed for servicing) include extras such as a complete overhaul gasket set, front and rear crankshaft seals, connecting rod bushings, connecting rod capscrews and camshaft or balancer shaft bushings (where applicable).

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W.H.O.

(Continued from Page 15)

tor lift and elevator fold are all hydraulically operated. Electronic sensor produces smooth continuous grinding even in dense or tough material. The cylinder is 43 inches long and 25 inches in diameter with hammers extended. Fifty-four free swinging hammers are standard (up to 108 possible). The elevator is extra tall, 26 feet long, and has a cleated belt. A radiator screen, filter precleaner and engine hood are standard equipment.

The P8-43 Portable Hay Grinder is built to the same standards of performance and dependability W.H.O. has been building into grinders for the past 45 years.

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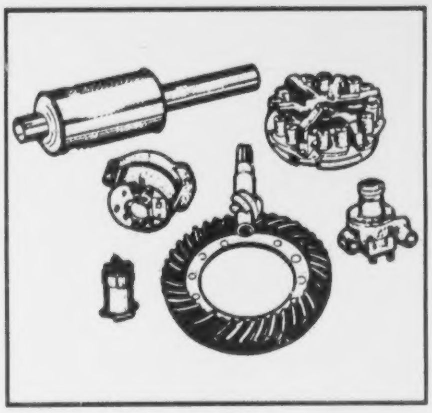
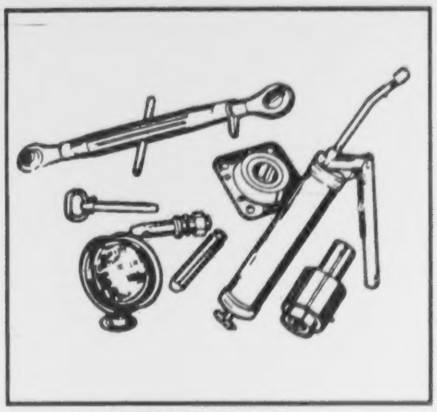
AMERICA'S NO. 1 "ALL MAKES" PARTS SOURCE
FOR FARM EQUIPMENT DEALERS

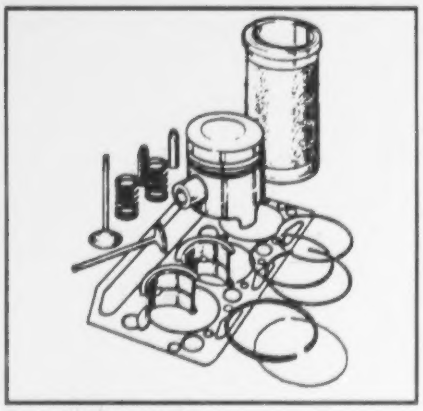
"YOUR SUPPLIER . . . NOT YOUR COMPETITOR"



- TRACTOR PARTS
- COMBINE PARTS



- IMPLEMENT PARTS
- CUTTER BAR PARTS
- BEARINGS



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